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SMITHSONIAN INSTITUTION
UNITED STATES NATIONAL MUSEUM
Bulletin 68

A MONOGRAPH OF WEST AMERICAN PYRAMIDELLID MOLLUSKS

BY

WILLIAM HEALEY DALL and PAUL BARTSCH
Of the Division of Mollusks, U. S. National Museum

WASHINGTON
GOVERNMENT PRINTING OFFICE
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ADVERTISEMENT.

The scientific publications of the National Museum consist of two series—the *Bulletin* and the *Proceedings*.

The *Bulletin*, publication of which was begun in 1875, is a series of more or less extensive works intended to illustrate the collections of the United States National Museum and, with the exception noted below, is issued separately. These bulletins are monographic in scope and are devoted principally to the discussion of large zoological and botanical groups, faunas and floras, bibliographies of eminent naturalists, reports of expeditions, etc. They are usually of octavo size, although a quarto form, known as the Special Bulletin, has been adopted in a few instances in which a larger page was deemed indispensable.

This work forms No. 68 of the Bulletin series.

Since 1902 the volumes of the series known as "Contributions from the National Herbarium," and containing papers relating to the botanical collections of the Museum, have been published as bulletins.

The *Proceedings*, the first volume of which was issued in 1878, are intended as a medium of publication of brief original papers based on the collections of the National Museum, and setting forth newly acquired facts in biology, anthropology, and geology derived therefrom, or containing descriptions of new forms and revisions of limited groups. A volume is issued annually, or oftener, for distribution to libraries and scientific establishments, and in view of the importance of the more prompt dissemination of new facts a limited edition of each paper is printed in pamphlet form in advance.

Richard Rathbun,
Assistant Secretary, Smithsonian Institution,
In charge of the United States National Museum.

Washington, U. S. A., *November 10, 1909.*

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A MONOGRAPH OF WEST AMERICAN PYRAMIDELLID MOLLUSKS.

By William Healey Dall and Paul Bartsch,
Of the Division of Mollusks, U. S. National Museum.

INTRODUCTION.

The Pyramidellidæ are a family of mollusks mostly of small size and world-wide distribution. No record of unmistakable Pyramidellidæ has been found in the Cretaceous faunas, though such may occur, but they are numerous in the Tertiaries and perhaps most fully represented in the existing faunas.

Numerous names have been applied to them; sometimes a particular group has been supposed to have no plication on the pillar, a mistake which can be corrected by grinding down the whorls so as to expose the interior more fully than may be done by inspecting the natural aperture. The plication in such cases is present, but falls short of reaching a point where it can be observed through the aperture.

In all the species of which the soft parts are known the external anatomy is very similar. In examining a large number of species, as noted by Fischer, intermediate types occur, until it becomes a matter of great difficulty to decide where, if anywhere, the generic lines can be drawn. It is not surprising that some authors have resorted to the expedient of regarding most of the species, notwithstanding the contrasted extremes of the series, as belonging to a single genus. When a group is composed of such a multitude of species, it seems more convenient in practice and leads more efficiently to clear thinking to take the other view, and subdivide the groups sufficiently to make it reasonably clear where a given species belongs in the series.

In the absence of anatomical characters it has been necessary to fall back in large part on the form and sculpture of the shell the presence or absence of an umbilicus, and the character of the plications on the pillar, as distinctive characters, although it must be admitted that between the different sections some intermediate forms may occur. So many names have been applied to members of the group that in most cases it has not been necessary to coin new denominations. The synonymy, which is often much involved, is treated of in the text which follows.

The classification adopted is essentially that proposed by us in our synopsis of the family published in February, 1904. Some revision and some additions as was expected have been found necessary.

Many of the specific names given in the past by different authors have been repeatedly used for different species, rendering it necessary in many cases to give new ones. In all cases the synonymy of group names adopted has been based on researches which began with the typical species of the original authors, which in the case of some of the more anciently named forms has involved no little labor.

When any doubt existed in regard to the internal characters the specimens have been ground down until the pillar has been made visible over a great part of its extent, and in all cases the characters recorded are the result of microscopical examination. Only a few of the many named forms have been inaccessible, as the collection of the U. S. National Museum is remarkably rich in species of this group, while the junior author, during a recent visit to England, has been able to examine the original types of Carpenter and Adams in the British Museum, and later visited Amherst, Massachusetts, to confirm earlier notes on the types contained in the C. B. Adams collection, the property of Amherst College. The Zoological Museum of Berlin, Germany, submitted its entire collection for study, and the authorities of the Zoological Museum of Copenhagen, of the Academy of Natural Sciences of Philadelphia, and of Amherst College, of the University of California, of the U. S. Bureau of Fisheries, of the Field Museum of Chicago, of the American Museum of Natural History, New York City, granted facilities for study, for photographing type-specimens or at various times loaned material required for study. The facilities of the National Museum have, of course, been at the disposition of the writers, and most of the types of species form part of its collection.

The amount of assistance rendered by private correspondents and collectors has been very large. Many of the friends of the Museum have sent in all their Pyramidellid material, and have allowed it to remain for study, in some cases several years. Others have generously resigned the opportunity of working up themselves the material they had collected and have donated to the Museum type-specimens of rare and even unique forms. For this generous assistance we are deeply indebted. Among those to whom we desire to make the most cordial acknowledgment are Mr. and Mrs. T. S. Oldroyd, Mr. Herbert N. Lowe, and Mrs. Eshnaur, of Long Beach, California; Dr. Fred Baker, Prof. F. W. Kelsey, Mrs. Kate Stephens, Mr. Henry Hemphill, Mr. C. W. Gripp, of San Diego; Mr. Fred L. Button, of Oakland; Mr. S. S. Berry and Mr. J. H. Paine, of Stanford University; Rev. Dr. G. W. Taylor, of Nanaimo, British Columbia; Hon. Delos Arnold and Dr. Ralph Arnold, of Pasadena, California; and Dr. R. E. C. Stearns, of Los Angeles, California; Mr. E. A. Smith, of the British Museum, and Dr. G. W. Chaster, of Southport, England. Among those who have contributed material bearing on the general subject though not on the West American fauna in particular, we are especially indebted to Rev. H. W. Winkley, of Danvers, Massachusetts. Material in the collection of the U. S. National Museum, contributed without special reference to this monograph, was received from Mr. Belding, Mr. S. A. L. Brannan, Mr. Blood, Mr. J. G. Cooper, Mr. P. P. Carpenter, Dr. W. H. Dall, Mr. G. H. Eldridge, Mr. W. J. Fisher, Mr. Hansen, Dr. George Hewston, Mr. O. B. Johnston, Mr. E. Jewett, Mr. Trevor Kincaid, Mr. C. B. Kennerley, Mr. A. Krause, Mrs. Merrihew, Dr. C. F. Newcombe, Capt. H. Nichols, U. S. Navy, Mr. C. R. Orcutt, Dr. E. Palmer, Mr. E. S. Roper, Mr. J. G. Swan, Mr. J. O. Snyder, Mr. Turrill, Mr. F. Woodworth, and Mr. J. Xantus. We have had the advantage of consulting specimens from the Eocene of the Paris Basin, named by M. Maurice Cossmann, of Paris. Lastly, the Jeffreys collection with its multitude of specimens, author's examples, types, and cotypes, of British, abyssal Atlantic, north European, and Mediterranean species, has been a means of reference without which we should have been in numerous instances most seriously handicapped.

The senior author desires to say that with the exception of this introduction and a certain amount of editorial supervision and advisory assistance, the labor of microscopically studying the specimens and preparing the manuscript of this paper is the work of the junior author, to whom the credit should be given. This labor has been very great and has been performed in the intervals of other work officially more pressing. We hope, therefore, that friends who have from time to time intrusted us with material which has often been retained for a considerable time before being returned to its owners, will make allowances for what has in no case been intentional delay or neglect.

We may here repeat an explanation printed in 1904, that the Museum Calonnianum is an anonymous pamphlet with no publisher's name attached to it, no diagnosis or figures, and which was not prepared by George Humphrey, the dealer who distributed it. We have therefore declined to regard the name *Obeliscus*, which is contained in it, as having been regularly published, or as having precedence over *Pyramidella* Lamarck.

A brief historical review of the progress of the study of the Pyramidellidæ on the western shores of the two Americas may be in place here.

While it is probable that Hugh Cuming, in the first third of the nineteenth century, during his researches on the coast of western South America, may have collected some Pyramidellidæ, the systematists who described his novelties after his return to England were long busy with the larger, more attractive, and more conspicuous shells.

The first Pyramidellid described was named by Alcide D'Orbigny in 1840, in the report of his voyage to South America, the *Chemnitzia cora* from Peru.

The next contribution was that of Prof. C. B. Adams, of Amherst College, in his account of the shells of Panama, published in 1852, in the Annals of the Lyceum of Natural History of New York. It included the following species: *Pyramidella conica; Chemnitzia aculeus, acuminata, affinis, clathratula, communis, gracilior, major, marginata, panamensis, similis, striosa, turrita; Cingula inconspicua, paupercula, terebellum,* and *turrita.*

In the same year Dr. A. A. Gould described, in the Boston Journal of Natural History, from Mexico and the Gulf of California, the following species: *Odostomia gravida* and *achates; Chemnitzia torquata.*

In 1854, Karl Theodor Menke, in the Malakozoölogische Blätter, described *Pyramidella bicolor,* from California. In the same year Arthur Adams, editing the Pyramidellidæ of Sowerby's Thesaurus Conchyliorum, named *Obeliscus hastatus* and *clavulus.*

The most numerous addition to the known species of the coast yet made appeared in 1856 in the Mazatlan Catalogue of the Reigen collection in the British Museum, by Dr. Philip P. Carpenter. This comprised the following forty species: *Odostomia sublirulata, lamellata, subsulcata, vallata, mammillata, tenuis; Parthenia scalariformis, quinquecincta, lacunata, armata, exarata, ziziphina; Chrysallida ovata, nodosa, rotundata, oblonga, telescopium, reigeni, effusa, fasciata, ovulum, convexa, photis, indentata, clausiliformis; Chemnitzia c-b-adamsi, muricata, prolongata gibbosa, gracillima, undata, flavescens, terebralis, tenuilirata, unifasciata; Dunkeria paucilirata, subangulata, cancellata, intermedia;* and *Eulimella obsoleta.* Camera drawings of these by Doctor Carpenter are among the archives of the U. S. National Museum.

Mörch, in the Malakozoölogische Blätter for 1859, describes *Turbonilla craticulata, subula,* and *cinctella.* Baird in the Proceedings of the Zoological Society of London, 1863, names *Chemnitzia vancouverensis.*

In the report of the British Association for the Advancement of Science for 1863, Dr. P. P. Carpenter names the following species: *Pyramidella adamsi; Obeliscus variegatus; Odostomia nuciformis,* and variety *avellana, O. satura* and variety *gouldii, O. inflata, straminea, tenuisculpta, cincta,* and *pumila; Dunkeria laminata; Chemnitzia tridentata, chocolata* varieties *aurantia, subcuspidata,* and *stylina, C. virgo;* all these have a few words of diagnosis, but not enough to identify them. They were more fully described later. The same author in the Annals and Magazine of Natural History for 1864, pages 46–47, describes *Obeliscus variegatus, Odostomia* (*Evalea*) *æquisculpta* and *delicatula*, and *Chrysallida angusta*. In the same publication for 1865 he describes *Odostomia satura, gouldii, nuciformis, avellana, tenuisculpta*, and *inflata; Chemnitzia crebrifilata*, variety *stylina*, and *virgo; Dunkeria laminata;* and *Chemnitzia cœlata.*

In the Journal de Conchyliologie for April, 1865, Doctor Carpenter names *Odostomia straminea, Chemnitzia tridentata*, and (var.?) *aurantia*. The last contribution to the knowledge of this group made by Doctor Carpenter was during the following year, when in the Proceedings of the California Academy of Sciences, page 219, he describes *Chrysallida pumila.*

William M. Gabb, in the same publication (p. 186) a year earlier had added *Turbonilla gracillima* (now *T. gabbiana*) to the California fauna.

In a separate publication on the minute shells found on imported pearl oysters, and entitled "Les Méléagrinicoles," in 1867 the Marquis de Folin describes from the Pacific coast (?) *Turbonilla festiva* and *Chemnitzia rangii.*

In 1870, in the American Journal of Conchology, page 66, Dr. J. G. Cooper changes the preoccupied name *Turbonilla gracillima* Gabb into *T. gabbiana* Cooper.

In the series entitled "Les Fonds de la Mer," vol. 2, 1872, the Marquis de Folin describes the following species: *Salassia carinata; Noëmia proxima, pulchra, angusta*, with varieties *contracta* and *ovata; Odetta recta* and *elegans.*

Among some Vancouver shells described in the Annals and Magazine of Natural History for 1880, by Mr. E. A. Smith, we find *Chemnitzia lordi.*

In the report on the Gastropoda of the Blake expedition, 1889, Dall describes *Pyramidella auricoma;* and in the Bulletin of the Natural History Society of British Columbia, 1897, page 14, he names *Mumiola tenuis*, subsequently found to be preoccupied, and renamed *Odostomia* (*Menestho*) *pharcida* Dall and Bartsch.

In Zoë (vol. 4, 1894, p. 395), Hemphill named a shell *Eulimella occidentalis*, but this has proved not to be a Pyramidellid.

In a monograph in the new edition of the Conchylien Cabinet of Martini and Chemnitz, Clessin named *Odostomia krausei* and *panamensis*, in 1900.

In a memoir by Dr. Ralph Arnold on the Marine Pliocene and Pleistocene of San Pedro, California, the portion relating to the Pyramidellidæ was prepared by the authors of the present paper, March, 1903. Twenty-three species are treated of, the types of which are in the National Museum, and of these the following are regarded as new: *Turbonilla pentalopha, auricoma, latifundia, lowei* and variety *pedroana, arnoldi,* and *adleri; Odostomia stearnsii, diegensis,* and *grammatospira.*

In 1904, the present authors prepared and published in the Proceedings of the Biological Society of Washington a Synopsis of the Genera, Subgenera, and Sections of the Family Pyramidellidæ. This hardly admits of condensation, but contains numerous new divisional names and the descriptions of the following new species serving as types of groups named in the table: *Pyramidella* (*Sulcorinella*) *dodona, Turbonilla* (*Baldra*) *archeri, Odostomia* (*Vilia*) *pilsbryi,* and *Odostomia* (*Evalina*) *americana,* of which, however, only the last-mentioned is a native of the Pacific coast.

In 1906, through the kind intervention of the late Prof. Eduard von Martens, in charge of the conchological collection of the Berlin Zoological Museum, we received for study their entire series of Pyramidellidæ, including numerous author's types derived from many sources, of which the most important were from the collections of the late Henry and Arthur Adams, of Paetel, of Dunker, of Clessin and of Hilgendorf. Numerous species inadequately described by Arthur Adams were included, and were for the first time figured and placed on a valid basis in the report on this collection.[a] Among the species discussed or described from the west coast of America in this report were the following: *Odostomia* (*Evalea*) *sitkaënsis* Clessin, *O.* (*Amaura*) *martensi* n. n., *O.* (*A.*) *krausei* Clessin, *O.* (*Heida*) *panamensis* Clessin; *Pyramidella* (*Longchæus*) *bicolor* Menke, *P.* (*Pharcidella*) *hastata* A. Adams, and *P.* (*P.*) *moffati,* n. n.

In 1907,[b] the present writers discussed the Pyramidellid mollusks of the Oregonian faunal area. In that paper the following new species, or names, appear for the first time: *Turbonilla gilli* (and subspecies *delmontensis*); *T.* (*Chemnitzia*) *montereyensis* n. n. (= *gabbiana* J. G. Cooper), *T.* (*C.*) *muricatoides; T.* (*Strioturbonilla*) *serræ; T.* (*Pyrgolampros*) *taylori, T.* (*P.*) *berryi, T.* (*P.*) *lyalli, T.* (*P.*) *victoriana, T.* (*P.*) *valdezi, T.* (*P.*) *newcombei, T.* (*P.*) *oregonensis; T.* (*Pyrgiscus*) *canfieldi, T.* (*P.*) *mörchi, T.* (*P.*) *antestriata, T.* (*P.*) *eucosmobasis, T.* (*P.*) *castanea* (= *castanella,* Dall, later); T. (*Mormula*) *eschscholtzi; Odostomia* (*Chrysallida*) *cooperi, O.* (*C.*) *astricta, O.* (*C.*) *montereyensis, O.* (*C.*) *oregonensis, O.* (*Ividia*) *navisa* (and subspecies *delmontensis*); *O.* (*Iolæa*) *amianta; O.* (*Menestho*) *pharcida* n. n., *O.* (*M.*) *harfordensis, O.* (*M.*) *exara; O.* (*Evalea*) *tillamookensis, O.* (*E.*) *angularis, O.* (*E.*) *jewetti, O.* (*E.*) *columbiana, O.* (*E.*) *deliciosa, O.* (*E.*) *tacomaënsis, O.* (*E.*) *valdezi, O.* (*E.*) *phanea; O.* (*Amaura*) *kennerleyi,* and *O.* (*A.*) *montereyensis* (preoccupied, later *O. canfieldi* Dall).

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[a] Proc. U. S. Nat. Mus., vol. 30, pp. 321 to 369, with ten plates.

[b] Idem, vol. 33.

Two of the species above mentioned having been inadvertently given names which had already been used, W. H. Dall in the Nautilus for March, 1908, proposed the new names *Turbonilla* (*Pyrgiscus*) *castanella* and *Odostomia* (*Amaura*) *canfieldi*, for *T. castanea* and *O. montereyensis*.

In 1908,[a] Dall describes *Odostomia* (*Evalea*) *atossa* from San Pedro, California.

It would have extended this review to inordinate length had we attempted to refer to the instances where west American species are merely alluded to in the literature.

The drawings with which the present paper is illustrated were mostly made by Miss Evelyn G. Mitchell; some of them were the work of our regretted collaborator, the late Dr. J. G. McConnell.

The temperatures of seawater cited in the text are in degrees of the Fahrenheit scale.

CLASSIFICATION.

Family PYRAMIDELLIDÆ.[b]

Gastropods with the radula absent or obsolete; the operculum ovoid paucispiral, with the apex anterior, a thread-like arcuate ridge on the proximal side, the inner margin notched in harmony with the plaits of the pillar when prominent; foot short, moderately pointed behind, with a small operculigerous lobe above and sometimes a small tentacular appendix on each side, in front feebly auriculate or undulate; mantle feebly canaliferous on the right upper margin; a single branchia; verge subcylindric, elongate; head with two flattened subtriangular or elongate tentacles, connate, grooved or auriform in the larger forms, the funicles with a ciliated area; eyes behind or between the bases of the tentacles; below the tentacles an oral orifice from which extends a long retractile subcylindric proboscis, but there is no muzzle like that of *Scala;* below the oral orifice is an organ named by Lovèn the *mentum*, which is usually more or less medially grooved or fissured, and hence, at its anterior end, more or less bilobate, and extensile or retractile before or behind the front margin of the foot. The shell is turrited, with a plicate axis;

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[a] Proc. U. S. Nat. Mus., vol. 34.

[b] In the preparation of the present diagnoses the following terminology is used:

"Axial sculpture," the markings which extend from the summit of the whorls toward the umbilicus.

The axial sculpture may be—

"Vertical," when the markings are in general parallelism with the axis of the shell.

"Protractive," when the markings slant forward from the preceding suture.

"Retractive," when the markings slant backward from the suture.

"Spiral sculpture," the markings following the directions of the coils of the whorls.

the outer lip frequently internally lirate; in the larger forms the aperture is obscurely channeled in front; the larval shell is sinistral the adult dextral, the former frequently set at an angle to the adult axis, or more or less immersed in the adult apical whorls; it is usually helicoid and smooth; the sculpture varies from nothing to ribbed, spirally sulcate or reticulate; the coloration when present usually reddish, brownish or yellow. The eggs are numerous and deposited in a lenticular mass. The distribution is world-wide, but the larger forms are mostly tropical.

SYNOPSIS OF THE GENERA, SUBGENERA, AND SECTIONS.

SYNOPSIS OF THE GENERA.

Genus PYRAMIDELLA Lamarck.

Shell elongate-conic, whorls usually inflated and regularly increasing; the pillar with from one to three folds; the outer lip entire; the shell usually larger than in *Turbonilla*.

Type.—Trochus dolabratus Linnæus.

Genus TURBONILLA Risso.

Shell cylindro-conic, many whorled, generally slender; columellar fold single, varying in strength, outer lip entire; shell usually smaller than in *Pyramidella* and larger than in *Odostomia*.

Type.—Turbonilla typica Dall and Bartsch=*Turbonilla plicatula* Risso, not *Turbo plicatulus* Scacchi.

Genus ODOSTOMIA Fleming.

Shell usually short, few whorled, subconic or ovate; columellar fold single, varying in strength, outer lip entire.

Type.—Turbo plicatus Montague.

Genus MURCHISONELLA Mörch.

Shell minute, cylindro-conic; outer lip with an anal sinus behind the periphery of the whorl; pillar with the plait obsolete or internal. whorls numerous and inflated.

Type.—Murchisonella spectrum Mörch.

KEY TO THE SUBGENERA OF PYRAMIDELLA.[a]

A¹ Columellar folds three.
  Shell umbilicated.
    Basal fasciole absent, surface polished, marked by extremely faint lines of growth and microscopic spiral striations.
      Subgenus **Pyramidella** Lamarck, s. s., 1799 (p. 19).
        Type, *Trochus dolabratus* Linnæus.

    Basal fasciole present, surface less polished than in *Pyramidella* s. s., marked by lines of growth and microscopic spiral striations.
      Subgenus **Milda** Dall and Bartsch, 1904 (1).
        Type, *Obeliscus ventricosus* Quoy.

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[a] In order to keep the key in its present compact form we have placed all references to citations and synonyms at the end of the key. The numbers in brackets (1–45) following the names refer to the citations.

A¹ Columellar folds three—Continued.
  Shell not umbilicated.
    Surface polished, marked only by fine lines of growth and microscopic spiral striations.
      Periphery sulcate.
        Subgenus **Longchæus** Mörch, 1875 (p. 21).
          Type, *Pyramidella punctata* Schubert and Wagner.

      Periphery not sulcate.
        Subgenus **Voluspa** Dall and Bartsch, 1904 (p. 19).
          Type, *Pyramidella auricoma* Dall.

    Surface sculptured.
      Basal cords absent.
        Periphery sulcate.
          Shell marked by strong axial ribs which terminate at the periphery, and microscopic spiral striations.
            Subgenus **Pharcidella** Dall, 1889 (p. 25).
              Type, *Pharcidella folinii* Dall.

          Shell marked by strong spiral keels and weak axial riblets.
            Subgenus **Callolongchæus** Dall and Bartsch, 1904 (2).
              Type, *Pyramidella jamaicensis* Dall.

        Periphery not sulcate.
          Shell marked by strong axial ribs, intercostal spaces strongly spirally striated, aperture auricular.
            Subgenus **Otopleura** Fischer, 1885 (3).
              Type, *Pyramidella auris-cati* Chemnitz.

      Basal cords present.
          Shell marked by strong spiral ridges, moderately strong axial ribs and two basal cords.
            Subgenus **Triptychus** Mörch, 1875 (4).
              Type, *Triptychus niveus* Mörch.

A² Columellar folds two.
  Shell umbilicated.
    Surface polished, marked by very fine lines of growth and microscopic spiral striations.
        Subgenus **Tiberia** Monterosato, 1875 (5).
          Type, *Pyramidella nitidula* A. Adams.

    Surface polished, marked by fine lines of growth and strong spiral striations.
        Subgenus **Ulfa** Dall and Bartsch, 1904 (2).
          Type, *Pyramidella* (*Ulfa*) *cossmanni* Dall and Bartsch =*Syrnola striata* Cossmann.

    Surface marked by strong axial ribs, intercostal spaces spirally pitted; early post-nuclear whorls sculptured differently from the later ones.
        Subgenus **Tropæas** Dall and Bartsch, 1904 (2).
          Type, *Pyramidella subulata* A. Adams.

  Shell not umbilicated.
    Surface polished, marked by very faint lines of growth and microscopic spiral striations.
      Basal fasciole present.
        Subgenus **Vagna** Dall and Bartsch, 1904 (2).
          Type, *Pyramidella paumotensis* Tryon.

A^2 Columellar folds two—Continued.
  Shell not umbilicated—Continued.
    Surface polished, marked by very faint lines of growth and microscopic spiral striations—Continued.
      Basal fasciole absent.
          Subgenus **Eulimella** Forbes, 1846 (6).
            Type, *Eulimella crassula* Forbes, =*E. scillæ* Scacchi.

        Aperture subquadrate.
          Section **Eulimella** Forbes, s. s.
        Aperture suboval.
          Section **Cossmannica** Dall and Bartsch, 1904 (7).
            Type, *Pyramidella clandestina* Deshayes.
A^3 Columellar fold one.
  Shell umbilicated.
    Surface polished, or with fine lines of growth and microscopic spiral striations.
      Peripheral sulcus absent.
          Subgenus **Orinella** Dall and Bartsch, 1904 (8).
            Type, *Orina pinguicula* A. Adams.

      Peripheral sulcus present.
          Subgenus **Sulcorinella** Dall and Bartsch, 1904 (8).
            Type, *Pyramidella* (*Sulcorinella*) *dodona*, Dall and Bartsch.
  Shell not umbilicated.
    Large, heavy, elongated shells.
      Surface spirally lirate.
          Subgenus **Actæopyramis** Fischer, 1885 (9).
            Type, *Monoptygma striata* Gray.

    Slender, medium sized shells.
      Surface polished, marked by fine lines of growth and microscopic spiral striations.
        Postnuclear whorls increasing slowly in size at first, then rapidly, lending the shell a mucronate appearance.
          Subgenus **Styloptygma** A. Adams, 1860 (10).
            Type, *Monoptygma stylina* A. Adams.

        Postnuclear whorls increasing regularly in size.
          Subgenus **Syrnola** A. Adams, 1860 (11).
            Type, *Syrnola gracillima* A. Adams.

        Aperture suboval.
          Section **Syrnola** A. Adams, s. s.

        Aperture subquadrate.
          Section **Stylopsis** A. Adams, 1860 (12).
            Type, *Stylopsis typica* A. Adams.

      Surface spirally striated.
          Subgenus **Iphiana** Dall and Bartsch, 1904 (8).
            Type, *Syrnola densistriata* Garrett.

      Surface axially and spirally striated with a strong spiral keel at the summit of the whorls.
          Subgenus **Syrnolina** Dall and Bartsch, 1904 (8).
            Type, *Syrnola rubra* Pease.

The status of *Agatha virgo* A. Adams 1860, [*Menestho*, 1861, *Myonia*, 1861, *Amathis* 1861], is not known to us. From the meager description we are inclined to believe that it is allied to *Actæopyramis* Fischer.

KEY TO THE SUBGENERA OF TURBONILLA.

A¹ Shells without basal keels.

B ¹ Varices absent.

Spiral sculpture absent, or if present consisting of microscopic striations only.

Surface of the early post-nuclear whorls marked by feeble axial ribs, later ones smooth.

Subgenus **Ptycheulimella** Sacco, 1892 (p. 59).

Type, *Tornatella pyramidata* Deshayes.

Surface marked by strong axial ribs which terminate at the periphery of the whorls, intercostal spaces excavated between the sutures.

Nuclear whorls helicoid on planorboid.

Subgenus **Chemnitzia** Orbigny, 1839 (p. 33).

Type, *Melania campanellæ* Philippi.

Nuclear whorl elongate pupoid.

Subgenus **Nisiturris** Dall and Bartsch, 1906.

Type, *Chemnitzia crystallina* Dunker.

Surface marked by strong axial ribs and intercostal spaces which extend over the periphery to the umbilical region.

Subgenus **Turbonilla** Risso, 1826 (p. 29).

Type, *Turbonilla* {*typica* Dall and Bartsch= *plicala* Risso.

Spiral sculpture present, always stronger than microscopic striations.

C ¹ Axial sculpture consisting of well developed ribs.

Spiral markings consisting of many very fine spiral striations.

Aperture subquadrate.

Shell with peripheral sulcus.

Pselliogyra, new subgenus.

Type, *Turbonilla monocycla* A. Adams.

Shell without peripheral sulcus.

Subgenus **Strioturbonilla** Sacco, 1892 (p. 40).

Type, *Strioturbonilla alpina* Sacco.

Aperture suboval.

Subgenus **Pyrgolampros** Sacco, 1892 (p. 59).

Type, *Pyrgolampros mioperplicatulus* Sacco.

Spiral marking absent between the sutures, base strongly spirally lirate.

Subgenus **Sulcoturbonilla** Sacco, 1892 (14).

Type, *Tornatella turricula* Eichwald.

Spiral markings consisting of strong striations.

Summits of the whorls strongly shouldered.

Subgenus **Pyrgisculus** Monterosato, 1884 (p. 126).

Type, *Melania scalaris* Philippi.

Summits of the whorls not strongly shouldered.

Subgenus **Pyrgiscus** Philippi, 1841 (p. 74).

Type, *Melania rufa* Philippi.

Spiral markings consisting of one or two strong punctate cords in the intercostal spaces between the sutures; whorls slightly shouldered.

Subgenus **Pyrgolidium** Monterosato, 1884 (15).

Type, *Pyrgolidium roseum* Montagu.

A¹ Shells without basal keels—Continued.
  B¹ Varices absent—Continued.
    Spiral sculpture present, always stronger than microscopic striations—Con.
      C¹ Axial sculpture consisting of well developed ribs—Continued.
        Spiral markings consisting of one or two strong cords; whorls somewhat overhanging.
          Subgenus **Tragula** Monterosato, 1884 (16).
            Type, *Odostomia fenestrata* Forbes.

        Spiral markings consisting of three to six raised threads between the sutures and lirations on the base; whorls strongly shouldered.
          Subgenus **Dunkeria** Carpenter, 1857 (p. 120).
            Type, *Dunkeria subangulata* Carpenter.

      C² Axial sculpture consisting of faint riblets
        Spiral markings consisting of strong raised threads.
          Subgenus **Cingulina** A. Adams, 1860 (17).
            Type, *Cingulina cingulata* Dunker.

        Spiral sculpture consisting of depressed lirations, sculpture granulose.
          Subgenus **Saccoina**, new name (18).
            Type, *Spica monterosatoi* Sacco.

      C³ Axial sculpture consisting of lines of growth only.
        Spiral markings consisting of many subequally spaced striations; sculpture finely reticulated.
          Subgenus **Careliopsis** Mörch, 1874 (19) (p. 130).
            Type, *Monoptygma (Careliopsis) styliformis* Mörch.

      C⁴ Axial sculpture absent.
        Spiral markings consisting of a broad strong fold at the summit of the whorls, separated from the rest of the whorl by a deep, broad, rounded sulcus.
          Subgenus **Visma** Dall and Bartsch (20).
            Type, *Eulimella tenuis* Sowerby.
  B² Varices present.
        Surface marked by axial ribs and strong spiral striations.
          Subgenus **Mormula** A. Adams, 1864 (p. 110).
            Type, *Mormula rissoina* A. Adams.

        Surface marked by axial ribs and strong spiral lirations, sculpture granulose.
          Subgenus **Lancella** Dall and Bartsch, 1904 (21).
            Type, *Turbonilla (Lancea) elongata* Pease.

A² Shells with basal keels.
      Axial sculpture consisting of strong ribs.
        Spiral sculpture absent.
          Subgenus **Asmunda** Dall and Bartsch (p. 129).
            Type, *Chemnitzia turrita* C. B. Adams.

        Spiral sculpture present.
          Spiral sculpture consisting of strong ridges.
            Basal keels two.
            Subgenus **Peristichia** Dall, 1889 (22).
              Type, *Peristichia toreta* Dall.

            Basal keels three.
            Subgenus **Babella** Dall and Bartsch, 1906 (23).
              Type, *Turbonilla (Babella) cælatior* Dall and Bartsch.

A² Shells with basal keels—Continued.
    Axial sculpture consisting of strong ribs—Continued.
        Spiral sculpture present—Continued.
            Spiral sculpture consisting of two tumid ridges, one at the periphery the other at the summit of the whorls, and many fine striations in the intercostal spaces.
                Subgenus **Baldra** (24).
                    Type, *Turbonilla* (*Baldra*) *archeri* Dall and Bartsch.
    Axial sculpture consisting of lines of growth only.
            Spiral sculpture consisting of faint lirations.
                Subgenus **Discobasis** Cossmann, 1888 (25).
                    Type, *Aciculina demissa* Deshayes.

KEY TO THE SUBGENERA OF ODOSTOMIA.

A¹ Postnuclear whorls sculptured similarly throughout.
  B¹ Varices absent.
    C¹ Axial ribs present, rounded.
      Spiral markings, when present, consisting of mere microscopic striations.
        Shell inflated.
            Summit of the whorls slightly shouldered.
                Subgenus **Elodiamea** De Folin, 1884 (26).
                    Type, *Odostomia* (*Elodiamea*) *gisna*, new name = *Elodia elegans* De Folin, not *Odostomia* (*Evalea*) *elegans* A. Adams, 1860.
        Shell not inflated.
            Summit of the whorls not shouldered.
                Subgenus **Odostomiella** Bucquoy, Dautzenberg and Dollfus, 1883 (27).
                    Type, *Rissoa doliolum* Philippi.
            Summit of the whorls tabulated.
                Subgenus **Salassia** De Folin, 1885 (p. 134).
                    Type, *Odostomia* (*Salassia*) *tropidita*, new name = *Salassia carinata* De Folin.
      Spiral markings consisting of a strong, broad, raised cord at the summit of the whorls, separated from the remaining part by a strongly impressed spiral groove.
                Subgenus **Vilia** Dall and Bartsch 1904 (28).
                    Type, *Odostomia* (*Vilia*) *pilsbryi* Dall and Bartsch.
      Spiral markings consisting of two tumid ridges, one at the periphery and one at the summit of the whorls; with many striations on the base.
                Subgenus **Folinella** Dall and Bartsch, 1904 (28).
                    Type, *Amoura anguliferens* De Folin.
      Spiral markings consisting of several to many raised threads in the intercostal spaces, always less strongly developed than the axial ribs.
        Intercostal spaces crossed by equally spaced, raised spiral threads, sculpture reticulated.
                Subgenus **Trabecula** Monterosato 1884.
                    Type, *Odostomia jeffreysiana* Monterosato (29).
        Intercostal spaces crossed by several raised spiral threads, base not spirally marked.
                Subgenus **Parthenina** Bucquoy, Dautzenberg. and Dollfus, 1883 (30).
                    Type, *Turbo interstinctus* Montagu.

A^1 Postnuclear whorls sculptured similarly throughout—Continued.

B^1 Varices absent—Continued.

C^1 Axial ribs present, rounded—Continued.

Spiral markings consisting of several to many raised threads in the intercostal spaces, always less strongly developed than the axial ribs—Con.

Intercostal spaces crossed by several spiral threads, base spirally striated.

Subgenus **Besla** Dall and Bartsch, 1904 (p. 135).
Type, *Chrysallida convexa* Carpenter.

Spiral markings consisting of strong, raised threads or cords, equal to or even stronger than axial ribs.

Spiral cords equally spaced, and equally well developed between the sutures and on the base; sculpture nodulose throughout.

Subgenus **Mumiola** A. Adams, 1864 (31).
Type, *Monoptygma spirata* A. Adams.

Spiral cords subequally spaced between the sutures, where the sculpture is nodulose; base spirally lirate and axially striated.

Subgenus **Chrysallida** Carpenter, 1856 (p. 136).
Type, *Chemnitzia communis* C. B. Adams.

Spiral cords confined to the base.

Subgenus **Egilina** Dall and Bartsch, 1906.
Type, *Parthenia mariella* A. Adams (45).

Spiral markings consisting of impressed lines.

Spiral striations subequally spaced, present between the sutures and on the base of the whorls.

Subgenus **Pyrgulina** A. Adams, 1864 (p. 169).
Type, *Chrysallida casta* A. Adams.

Spiral striations on the base only, periphery deeply sulcated, axial ribs extending to the umbilical region.

Subgenus **Egila** Dall and Bartsch 1904 (p. 170).
Type, *Parthenia lacunata* Carpenter.

Spiral striations on the base only, axial ribs terminating at the periphery, which is not sulcated.

Subgenus **Spiralinella** Chaster, 1901 (32).
Type, *Turbo spiralis* Montagu.

C^2 Axial ribs present, lamellar.

Spiral markings lamellar.

Ribs and spiral lamellæ moderately strong, subequally spaced between the sutures and on the base; sculpture cuspidate.

Subgenus **Haldra** Dall and Bartsch, 1904 (p. 171).
Type, *Chrysallida photis* Carpenter.

Ribs and spiral lamellæ few, very strong.

Subgenus **Ividella**, new name (p. 172).
Type, *Odostomia* (*Ividia*) *navisa*, Dall and Bartsch.

C^3 Axial ribs present but very feeble, usually only indicated near the summit of the whorls.

Spiral markings consisting of several strong, broad, tumid cords, one or more of the posterior cords crenulated.

Subgenus **Miralda** A. Adams, 1864 (p. 176).
Type, *Parthenia diadema* A. Adams.

A¹ Postnuclear whorls sculptured similarly throughout—Continued.
  B¹ Varices absent—Continued.
    C³ Axial ribs present but very feeble, usually only indicated near the summit of the whorls—Continued.
      Spiral markings consisting of many subequally spaced lirations.
        Whorls tabulated at the summit.
          Subgenus **Ivara** Dall and Bartsch, 1903 (p. 179).
            Type, *Odostomia (Ivara) turricula* Dall and Bartsch.

        Whorls not tabulated.
          Subgenus **Evalina** Dall and Bartsch, 1904 (p. 180).
            Type, *Odostomia (Evalina) americana* Dall and Bartsch.

    C⁴ Axial ribs usually reduced to mere lirations, frequently only present between the spiral ridges.
      Spiral markings consisting of moderately well-developed cords usually equally spaced and present between the sutures and on the base; axial ribs indicated by faint threads between the spiral sculpture.
        Shell umbilicated.
          Subgenus **Iolæa** A. Adams, 1867 (p. 181).
            Type, *Iole scitula* A. Adams.

        Shell not umbilicated.
          Subgenus **Menestho** Möller, 1842 (p. 184).
            Type, *Turbo albulus* Fabricius.

    C⁵ Axial ribs absent; axial sculpture represented by lines of growth only.
      Spiral markings consisting of many, usually subequally and universally distributed impressed lines.
        Shell elongate-conic.
          Subgenus **Evalea** A. Adams, 1860 (p. 192).
            Type, *Evalea elegans* A. Adams.

        Shell short, subglobose.
          Subgenus **Oda** Monterosato, 1901 (33).
            Type, *Odostomia dolioliformis* Jeffreys.

    C⁶ Axial sculpture absent, shell polished.
      Spiral markings consisting of two tumid ridges, one at the periphery, and the other at the summit of the whorls.
          Subgenus **Cyclodostomia** Sacco, 1892 (34).
            Type, *Cyclodostomia mutinensis* Sacco.

      Spiral markings consisting of a more or less conspicuous tumid ridge on the summit of the whorls.
          Subgenus **Doliella** Monterosato, 1880 (35).
            Type, *Odostomia nitens* Jeffreys.

      Spiral markings consisting of a strong peripheral keel.
          Subgenus **Scalenostoma** Deshayes, 1863 (p. 229).
            Type, *Scalenostoma carinata* Deshayes.

      Spiral markings consisting of a peripheral sulcus.
          Subgenus **Jordaniella** Chaster, 1898 (36).
            Type, *Turbo nivosa* Montagu.

      Spiral sculpture absent or indicated only by extremely fine microscopic lines of growth or striæ; surface polished.
        Summits of the whorls with a strongly tabulated shoulder.
          Subgenus **Spiroclimax** Mörch, 1874 (37).
            Type, *Spiroclimax scalaris* Mörch.

A¹ Postnuclear whorls sculptured similarly throughout—Continued.

B¹ Varices absent—Continued.

C⁶ Axial sculpture absent, shell polished—Continued.

Summits of the whorls not tabulated.

Columellar fold present.

Peritreme discontinuous, aperture not rissoid.

Shell inflated, very large.

Subgenus **Amaura** Möller, 1842 (p. 218).

Type, *Amaura candida* Möller.

Shell not inflated.

Subgenus **Odostomia** Fleming, 1817 (p. 231).

Shell of medium size.

Section **Odostomia** Fleming, s. s. (p. 231).

Type, *Turbo plicatus* Montagu.

Shell rather large.

Section **Stomega** Dall and Bartsch, 1904 (38).

Type, *Odostomia conspicua* Alder.

Shell small.

Section **Brachystomia** Monterosato, 1884 (39).

Type, *Odostomia rissoidea* Hanley.

Peritreme continuous, aperture rissoid.

Subgenus **Heida** Dall and Bartsch, 1904 (p. 231).

Type, *Syrnola caloosaënsis* Dall.

Columellar fold obsolete.

Shell umbilicated.

Subgenus **Myxa** Hedley, 1903 (40).

Type, *Myxa exesa* Hedley.

Shell not umbilicated.

Peritreme continuous, aperture rissoid.

Subgenus **Pseudorissoina** Tate and May, 1900 (41).

Type, *Stilifer tasmanica* Tenison-Woods.

Peritreme not continuous, aperture not rissoid.

Subgenus **Liostomia** O. Sars., 1878 (42).

Type, *Rissœlla? eburnea* Stimpson.

B² Varices present.

Shell smooth, axial sculpture indicated by a few varices, spiral sculpture wanting.

Subgenus **Oceanida** De Folin, 1870 (43).

Type, *Oceanida gradata* De Folin.

Shell with sublamellar axial ribs.

Salassiella new subgenus (p. 133).

Type, *Odostomia* (*Salassiella*) *laxa* new species.

A² Early postnuclear whorls sculptured differently from the later ones.

Early postnuclear whorls loosely coiled, plain; later ones closely coiled with a spiral keel at the periphery and one at the summit of the whorls; base spirally lirate.

Subgenus **Lysacme** Dall and Bartsch (p. 132).

Type, *Chrysallida clausiliformis* Carpenter.

Early postnuclear whorls axially ribbed, succeeded by one or two strongly spirally and faintly axially lirate whorls; the rest of the whorls are marked by a reticulated sculpture consisting of raised axial and spiral cords.

Subgenus **Obtortio** Hedley, 1899 (44).

Type, *Rissoa pyrrhacme* Melvill and Standen, 1899.

REFERENCES TO CITATIONS AND SYNONOMY OF THE GENERA, SUBGENERA, AND SECTIONS OF THE FAMILY PYRAMIDELLIDÆ.

The page references after a name in the key refer to the present paper, while the numbers refer to the data cited below.

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WEST AMERICAN PYRAMIDELLIDÆ.

Genus PYRAMIDELLA Lamarck.

Pyramidella Lamarck, Prod. d'un Nouv. Class. des Coq., 1799, p. 76. =*Obeliscus* anonymous, Museum Calonnianum, 1797, p. 24. =*Pyramidellus* Montfort, Conch. Syst., vol. 2, 1810, p. 499.

Shell elongate-conic, increasing regularly in size with three folds on the columella in the subgenera *Pyramidella*, *Milda*, *Longchæus*, *Voluspa*, *Pharcidella*, *Callolongchæus*, *Otopleura*, and *Triptychus;* of these the first two are umbilicated, the rest imperforate. The following subgenera have two columellar folds, umbilicated: *Tiberia*, *Ulfa*, and *Tropæas:* imperforate: *Vagna*, *Eulimella*, and *Cossmanica*. In the uniplicate members *Orinella* and *Sulcorinella* are umbilicated and *Actæopyramis*, *Styloptygma*, *Syrnola*, *Stylopsis*, *Iphiana*, and *Syrnolina* imperforate. The shell is usually strongly polished and porcellanous in luster.

Type.—*Trochus dolabratus* Linnæus.

This genus is represented on the west coast by the subgenera *Pyramidella*, *Longchæus*, *Voluspa*, and *Pharcidella*.

KEY TO THE SUBGENERA OF PYRAMIDELLA.

Shell with axial ribs...*Pharcidella*, p. 25.
Shell without axial ribs.
  Shell umbilicated....................................*Pyramidella* s. s., p. 19.
  Shell not umbilicated.
    Peripheral sulcus present................................*Longchæus*, p. 21.
    Peripheral sulcus absent....................................*Voluspa*, p. 19.

Subgenus **PYRAMIDELLA** Lamarck, s. s.

Pyramidella LAMARCK, Prod. d'un Nouv. Class. des Coq., 1799, p. 76. =*Obeliscus* ANONYMOUS, Museum Calonnianum, 1797, p. 24. =*Pyramidellus* MONTFORT, Conch. Syst., vol. 2, 1810, p. 499.

Shell of many whorls, turrited, umbilicated; columella with three folds; outer lip usually reënforced within, at irregular intervals, by spiral lamellar thickenings. The sculpture consists of mere lines of growth and very fine spiral striations.

Type.—Trochus dolabratus Linnæus.

PYRAMIDELLA (PYRAMIDELLA) BAIRDI, new species.

Plate 1, figs. 5, 5*a*.

Shell broadly conic, milk-white, with a narrow pale yellow band at the periphery, deeply, broadly umbilicated. Nuclear whorls at least two and one-half, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-half immersed. Post-nuclear whorls well rounded. faintly roundly shouldered at the summit. Sutures well impressed. Periphery and base of the last whorl somewhat inflated, well rounded. Entire surface of spire and base marked by exceedingly fine lines of growth, and microscopic closely spaced spiral striations. Aperture rather large; posterior angle acute; outer lip thick within, where it is reenforced by six short spiral lirations, three of which fall anterior and three posterior to the periphery; columella straight, slender, provided with three folds, the posterior of one of which is strongly lamellar and at some little distance anterior to the insertion; the other two are less strongly developed and much more oblique.

The type (Cat. no. 73932, U.S.N.M.) has six post-nuclear whorls and measures: Length 5.1 mm., diameter 1.7 mm. It comes from the Gulf of California.

Named for W. Baird.

Subgenus **VOLUSPA** Dall and Bartsch.

Voluspa DALL and BARTSCH, Proc. Biol. Soc. Wash., vol. 17, 1904, p. 4.

Shell of many whorls, turrited, smooth, devoid of all sculpture other than mere lines of growth; *not* umbilicated; columella provided with three folds; outer lip frequently reenforced within at irregular intervals by spiral lamellar thickenings.

Type.—Pyramidella auricoma Dall.

KEY TO THE SPECIES OF THE SUBGENUS VOLUSPA.

Adult of 11 whorls, slender, length under 15 mm	*auricoma.*
Adult of 11 whorls, stout, length over 25 mm	*cerrosana.*

PYRAMIDELLA (VOLUSPA) AURICOMA Dall.

Plate 1, fig. 3.

Pyramidella auricoma Dall, Blake Report, Gastropoda, 1889, p. 332.

Shell regularly elongate-conic, yellowish-white, with fine golden yellow spiral lines between the sutures and on the base. Nuclear whorls small, deeply obliquely immersed in the first post-nuclear turn. Post-nuclear turns well rounded, feebly shouldered at the summit, scarcely at all contracted at the sutures. Sutures weakly impressed. Periphery and base of the last whorl well rounded, smooth. Aperture irregularly oval; outer lip thin, reënforced deeply within by five strong spiral cords, one of which is at the periphery, two divide the space between this and the summit into three equal parts, and two a little less strong are on the base; columella strong, straight, posterior fold very strong and lamellar, oblique; anterior two about one-fourth as high as the posterior, very oblique; parietal wall glazed by a thin callus.

The type (Cat. no. 32268, U.S.N.M) and two additional specimens were collected by Dr. Edward Palmer in the Gulf of California. The type has ten post-nuclear whorls and measures: Length 10.6 mm., diameter 3.8 mm. Another specimen (Cat. no. 168681, U.S.N.M.) comes from Mazatlan, Mexico.

PYRAMIDELLA (VOLUSPA) CERROSANA, new species.

Plate 1, fig. 1.

Shell very large, broadly conic. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, moderately shouldered at the summit, and moderately contracted at the sutures. Sutures well impressed. Periphery and base of the last whorl well rounded. Aperture ?; outer lip reënforced within by seven spiral lirations, one of which is at the periphery, three between this and the suture, of which the one next to the periphery is the strongest of all seven, while the two posterior to it are the weakest; the three anterior to the periphery are equally spaced and grow successively weaker; columella strong, straight; posterior fold very strong, lamellar; anterior two about one-fourth as strong, very oblique.

The type (Cat. no. 6332, U.S.N.M.) comes from Cerros Island, Lower California. It has lost the nucleus and early whorls; the ten remaining measure: Length 25.5 mm., diameter 10.2 mm.

Subgenus LONGCHÆUS Mörch.

Longchæus Mörch, Malak. Blätt., vol. 22, 1875, p. 158.

Shell elongate-conic, not umbilicated, having three columellar folds, a basal fasciole and peripheral sulcus. The entire surface is marked by fine lines of growth and microscopic spiral striations.

Type.—Pyramidella punctata Schubert and Wagner.

KEY TO THE SPECIES OF THE SUBGENUS LONGCHÆUS.

Shell variegated...*adamsi*, p. 21.
Shell not variegated.
  Shell rose-purple anteriorly.................................*bicolor*, p. 22.
  Shell brown.
    Adult shell more than 18 mm. long...........................*mexicana*, p. 23.
    Adult shell less than 14 mm. long.
      Sutures very strongly channeled...........................*conica*, p. 23.
      Sutures moderately channeled..............................*mazatlanica*, p. 24.

PYRAMIDELLA (LONGCHÆUS) ADAMSI Carpenter.

Plate 1, figs. 6, 6*a*.

Pyramidella adamsi Carpenter, Rept. Moll. West Coast Amer. Brit. Ass. Adv. Sci. (for 1863), 1864, pp. 546, 547. =*Obeliscus conicus* jun. Carpenter, Cat. Mazatlan Shells, 1856, pp. 409–10. =*Obeliscus variegatus* Carpenter, Ann. Mag. Nat. Hist., 3d ser., vol. 14, 1864, p. 46.

The type of this species is a very young individual of five post-nuclear whorls which was taken from a species of *Chama* at Mazatlan, Mexico. It is on tablet 1951 of the Liverpool collection in the British Museum.

Shell elongate-conic, early whorls white, later ones diversely variegated, frequently dark brown on the later turns. It is this striking variegated color pattern which at once distinguishes this species from the other west American forms. The spaces between the sutures are crossed by light areas, which are vertical in the middle, bending suddenly forward at the periphery and the summit, thus forming)-shaped areas. The space immediately below the peripheral sulcus on the base has short light areas, corresponding to those above the sulcus, but with retractive slant. The space between these light areas, near the summit, forms a series of elongated dark spots. The varices which are disposed at irregular intervals are chestnut brown, preceded usually by a band of white. Posterior half of the base light chestnut brown; anterior white. Nuclear whorls small, two, forming a planorboid spire whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-half immersed. Post-nuclear whorls flattened; moderately shouldered at the summit, which is crenulated. Periphery with a strong sulcus. Base moderately long, well rounded. Entire surface of spire and base marked by fine lines of growth and exceedingly fine, microscopic spiral striations. Aperture oval; outer lip thin, showing the following color marking within; a white zone at the periphery, a narrow chestnut band immediately posterior to the periphery and another at the summit, a broad band extending over half the base immediately below the peripheral zone; deep within, the lip is reënforced by five strong, spiral cords, one at the periphery, two on the base, and two between the periphery and the summit; columella strong, provided with a strong fasciole, posterior fold very strong, lamellar, anterior two very oblique, slender.

The specimen figured (Cat. no. 11866, U.S.N.M.) comes from La Paz, Mexico. It has lost the nucleus, the twelve remaining whorls measure: Length 11.3 mm., diameter 3.8 mm.

The following specimens have been examined:

U. S. N. M. cat. no.	No. of specimens.	Locality.	From whom received.	Depth, fathoms.	Temp., deg.	Disposition of material.
56764	1	San Diego, California				U. S. Nat. Mus.
46469	7	do.	Stearns coll.			Do.
109367	1	do.	H. Hemphill.			Do.
194465	1	Station 2901, off Santa Rosa Island, California.	U. S. Fish Com.	55.1	48	Do.
105558	3	Scammon Lagoon, Lower California.	H. Hemphill.			Do.
34171	1	La Paz, Lower California.	L. Belding.			Do.
11866	1	do.				Do.
46468	2	Gulf of California.	Stearns coll.			Do.

Cat. no. 206854, U.S.N.M., contains a young individual from Monterey, California, which is much smaller and more slender than the typical form, and may prove to be a new species when perfect material shall come to hand.

PYRAMIDELLA (LONGCHÆUS) BICOLOR Menke.

Plate 1, fig. 2.

Pyramidella bicolor MENKE, Malak. Blätt., vol. 1, 1854, p. 28.

Shell elongate-conic, shining. Early whorls white, the succeeding ones gradually acquiring a pinkish tinge, which deepens and finally tints the last whorl rose-purple. (Nuclear whorls decollated.) Post-nuclear whorls overhanging, flattened, slightly shouldered and minutely crenulated, and deeply sulcate at the periphery. Sutures strongly impressed. Base short, moderately rounded, with a weak fasciole at the insertion of the columella. Aperture?; (outer lip badly fractured); columella conic, moderately strong, provided with a strong lamellar fold at its insertion, a moderately strong median one and a weaker anterior to it; the last two much more oblique than the posterior.

The specimen described and figured (Cat. no. 13522, U.S.N.M.) comes from Guacamoyo, Mexico. It has eight post-nuclear whorls and measures: Length 9.8 mm., diameter 3.5 mm.

PYRAMIDELLA (LONGCHÆUS) MEXICANA, new species.

Plate 1, fig. 12.

Shell, large, robust, broadly conic, dull brown. (Nuclear whorls decollated.) All but the last post-nuclear whorl flattened, flatly shouldered and crenulated at the summit; the last inflated and well rounded. Periphery of the last whorl marked by a strong sulcus. Sutures channeled. Entire surface of spire and base marked by lines of growth, which are quite prominent on the last turn. Base inflated, strongly rounded, with a slender fasciole at the insertion of the columella. Aperture oval; posterior angle acute; slightly channeled anteriorly; outer lip thin, with a white band at the periphery, the remainder brown with darker colored lines, reenforced deeply within by five spiral cords, two of which are posterior and three anterior to the periphery; columella stout, conic, with a strong lamellar fold at its insertion and two much more oblique ones anterior to it.

The type (Cat. no. 105558, U.S.N.M.) comes from Scammon Lagoon, Lower California. It has lost the nucleus and probably the first post-nuclear turn; the thirteen remaining measure: Length 19 mm., diameter 6.5 mm. Another specimen (Cat. no. 56764, U.S.N.M.) was collected at San Diego, California.

PYRAMIDELLA (LONGCHÆUS) CONICA C. B. Adams.

Plate 1, fig. 9.

Pyramidella conica C. B. Adams, Ann. Lyc. Nat. Hist. of N. Y., 1852, p. 424.

Shell very regularly elongate, conic. Early whorls flesh-colored; later ones light brown with an occasional varix of flesh color. Nuclear whorls at least two and one-half, depressed helicoid, having their axis almost at right angles to that of the succeeding turns, in the first of which they are about half immersed. Post-nuclear whorls decidedly flattened, slightly shouldered and weakly crenulated at the summit, marked with a strong peripheral sulcus which is crossed by numerous axial threads. Periphery of the last whorl slightly angulated. Base short, well rounded, provided with a strong fasciole at the insertion of the columella. Entire surface of spire and base marked by numerous exceedingly fine lines of growth only. Aperture? Posterior angle acute; outer lip fractured, reënforced within by five slender lirations. Columella strong, slightly revolute. Posterior lamella very strong; anterior two much weaker and much more oblique. Parietal wall glazed with a faint callus.

Prof. C. B. Adams's type, at Amherst College, was collected at Panama Bay. It has thirteen post-nuclear whorls, and measures: Length 13 mm., diameter 4.3 mm.

The present species recalls *P.* (*L.*) *mazatlanica*, but differs in being in every way much larger and having the sutures decidedly more channeled.

PYRAMIDELLA (LONGCHÆUS) MAZATLANICA, new species.

Plate 1, fig. 7, 7*a*.

Shell very regularly conic, horn color, with a little darker band on the middle between the sutures, which is bordered at its anterior margin by a faint light line. Nuclear whorls two, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about two-thirds immersed. Post-nuclear whorls flattened, scarcely at all contracted at the suture, with a narrow, very finely crenulated shoulder at the summit. Sutures well impressed. Periphery of the last whorl strongly, sharply, and deeply sulcate. Base short, well rounded, with a strong fasciole at the insertion of the columella. Entire surface of spire and base marked only by lines of growth. Aperture irregularly oval; posterior angle acute, with a moderate channel anteriorly; outer lip thin, reënforced by four strong internal lirations, two of which are above and two below the periphery; columella slender, twisted and revolute, posterior fold lamellar, anterior two slender and very oblique.

The type (Cat. no. 162714, U.S.N.M.) was dredged at the U. S. Bureau of Fisheries station 3019, in 14 fathoms, temperature 66°, on broken shell bottom, off Cape Tepoca, west coast of Mexico. It has thirteen post-nuclear whorls and measures: Length 11 mm., diameter 3.5 mm. Another specimen (Cat. no. 46468, U.S.N.M.) comes from the Gulf of California. Two tips (Cat. no. 46477, U.S.N.M.) come from San Diego. A fragment (Cat. no. 206855, U.S.N.M.) was dredged by the U. S. Bureau of Fisheries station 3566 in 3 fathoms, off San Diego, California.

SPECIES OF UNCERTAIN STANDING OF THE SUBGENUS LONGCHÆUS.

ODOSTOMIA LAMELLATA Carpenter.

Odostomia lamellata Carpenter, Cat. Mazatlan Shells, 1856, p. 411.

Tablet 1954, British Museum, contains Carpenter's cotypes. One of these served for the description of the nucleus, and there is little more to it. The other is a badly fractured specimen which has lost the early whorls, the lip is broken so as to almost obliterate the two weak basal folds of the columella.

It may be a young specimen of *Pyramidella* (*Longchæus*) *mazatlanica*.

ODOSTOMIA SUBSULCATA Carpenter.

Odostomia subsulcata Carpenter, Cat. Mazatlan Shells, 1857, p. 411.

The two cotypes on tablet 1955 in the British Museum show one strong and two weak basal folds on the columella. They are young badly worn specimens of some species of *Longchæus*.

ODOSTOMIA VALLATA Carpenter.

Odostomia vallata Carpenter, Cat. Mazatlan Shells, 1857, pp. 411–412.

Tablet 1956 of the British Museum collection contains the three cotypes which like the above must be placed under *Longchæus* for the same reason.

Subgenus PHARCIDELLA Dall.

Pharcidella Dall, Bull. Mus. Comp. Zool., vol. 18, 1889, p. 233.

Shell of many whorls, turriculate, *faintly spirally striate*, not umbilicate; with faintly vertically ribbed sulcate periphery, surface of the whorls weakly ribbed; columellar folds three; outer lip usually provided with internal lirations.

Type.—Pharcidella folinii Dall.

KEY TO THE SPECIES OF THE SUBGENUS PHARCIDELLA.

Shell broadly conic, stout, large	*hastata*, p. 25.
Shell narrowly conic, slender, small	*panamensis*, p. 26.
Shell elongate-ovate.	
Aperture auricular	*moffati*, p. 26.
Aperture not auricular	*achates*, p. 27.

PYRAMIDELLA (PHARCIDELLA) HASTATA A. Adams.

Plate 1, fig. 4.

Obeliscus hastatus A. Adams, Sowerby Thes. Conch., 1854, p. 811, pl. 171, fig. 24.

Shell broadly elongate, conic, pale yellowish to flesh-color, irregularly clouded with light brown, shining. (Nuclear whorls decollated.) Post-nuclear whorls flattened, decidedly crenulated at their summits, with faint grooves extending from the base of the crenulations down and across the whorls giving them the appearance of being obsoletely ribbed. Sutures deep and channeled. Periphery of the last whorl angular, deeply sulcate, sulcus more or less regularly closely transversely ribbed. Base well rounded, axially striated, the striæ extending to the umbilical region and over the posterior columellar fold. Basal fasciole present. Entire surface covered with microscopic spiral striations. Aperture suboval, subchanneled at the junction of the outer lip and columella, posterior angle acute. Columella straight and strong, posterior fold very strong, lamellar slightly oblique; anterior two of about equal size and much more oblique than the posterior one. Inner surface of the outer lip provided at intervals with five lirations, two posterior and three anterior to the peripheral sulcus.

Three specimens of this species, all with decollated apex, are in the collection of the U. S. National Museum (Cat. no. 59321). They were collected at Acapulco, Mexico. The one figured is the largest fragment. It has eight whorls, (if complete it would probably have fourteen) and measures: Length 11.5 mm., diameter 4.6 mm. The Dunker collection of the K. K. Zoological Museum of Berlin contains two specimens of this species.

PYRAMIDELLA (PHARCIDELLA) PANAMENSIS, new species.

Plate 1, fig. 8, 8^a.

Shell slender, elongate-conic, horn-yellow, excepting the last whorl which is suffused with pale rose-purple. Nuclear whorls small, two and one-half, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is a little more than half immersed. Post-nuclear whorls flattened, flatly shouldered at the summit, which is crenulated and decidedly channeled at the periphery, marked on the posterior half by feeble riblets which disappear before reaching the middle of the whorl. Sutures strongly channeled. Periphery of the last whorl with a deep sulcus, which is crossed by numerous very slender and closely spaced axial riblets. Base well rounded, with a strong fasciole about the columella. Aperture oval; posterior angle acute, slightly channeled anteriorly; outer lip thin; columella slender, revolute, provided with a lamellar posterior fold at the insertion of the columella, and two equally slender, very oblique ones anterior to it.

The type and another specimen (Cat. no. 122792, U.S.N.M.) were dredged at U. S. Bureau of Fisheries station 2805, in 51 fathoms, mud bottom, in Panama Bay. It has twelve post-nuclear whorls and measures: Length 8.8 mm., diameter 3 mm.

PYRAMIDELLA (PHARCIDELLA) MOFFATI Dall and Bartsch.

Plate 1, fig. 11.

Obeliscus clavulus A. Adams, Sowerby Thes., 1854, p. 811, pl. 171, fig. 33, not *Obeliscus clavulus* (Ferussac) Beck, Index Moll., 1838, p. 62.=*Pyramidella (Pharcidella) moffati* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 30, 1906, p. 323.

Shell moderately large, strong, early part of the spire broadly conic, later subcylindric, white, marked diversely with various shades of rust brown. (Nuclear whorls decollated.) Post-nuclear whorls moderately rounded, scarcely at all contracted at the periphery, narrowly shouldered at the summit, which is finely crenulated, marked by many lines of growth, some of which are a little stronger than the rest, the stronger corresponding to the crenulations at the summit and lend the surface the appearance of being obsoletely ribbed. Periphery of the whorls marked by a slender well-impressed spiral channel, which is not apparent in the suture in the first four whorls, but from the fifth on, the summit of the whorl drops more and more anterior to the peripheral sulcus until, on the last whorl, it is about one-fifth of the distance between the whorls posterior to the suture. Base of the last whorl rather prolonged, marked by lines of growth, provided with a strong basal fasciole. Aperture ear-shaped; posterior angle acute; outer lip thin, marked in the following manner within: A white band immediately below the summit, one-fourth of the width of the space between the sutures, followed by an interrupted band of dark rust brown, succeeded by a broad area, clouded with various shades of rust brown which connect the dark colored band with the white columellar area; columella moderately strong, provided with three oblique folds, the posterior one of which is lamellar; parietal wall covered with a thin callus.

The specimen described belongs to the Paetel collection, Berlin Museum. It has nine post-nuclear whorls and measures: Length 11.5 mm., diameter 4 mm. It was labeled *Obeliscus achates* Gould, cf. *crocatus* A. Adams, Japan. In the aperture of the shell a specimen of *Anachis diminuta* C. B. Adams, was firmly wedged, which species is at home on the west coast of Central America and Mexico. The *Pyramidella* therefore very likely belongs to the same region. The type of *O. clavulus* A. Adams, comes from Acapulco, Mexico.

It is much narrower with much higher whorls, decidedly less channeled periphery and narrower aperture than *P.* (*Pharcidella*) *achates* Gould.

PYRAMIDELLA (PHARCIDELLA) ACHATES Gould.

Plate 1, fig. 10.

Odostomia achates Gould, Bost. Journ. Nat. Hist., vol. 6, 1852, p. 385, pl. 14, fig. 13.

Shell stout, shining, milk-white, with irregular, flammulated spots of rust color, which are densest about one-third of the distance between the sutures anterior to the summits, where they form an almost continuous band. (Nuclear whorls decollated.) Post-nuclear whorls weakly rounded, slightly shouldered and faintly crenulated at the summit, marked by lines of growth, which are somewhat variable in strength, the strongest being on the side of the crenulations. Sutures well impressed. Periphery marked by a moderately strong, spiral sulcus. Base rather long, crossed by many lines of growth. Aperture elongate-pyriform, rather compressed laterally; posterior angle acute; outer lip thin; columella short, heavy, bounded by a low, strong basal fasciole, bearing three oblique folds, the posterior one of which is lamellar and situated a little anterior to the insertion of the columella; the other two folds are much less strongly developed and more oblique; parietal wall covered with a thin callus.

The type (Cat. no. 43, Orig. no. (228) A. 3111) is in the State Museum at Albany, New York. It is said to have been collected at Santa Barbara, California, which we consider doubtful. It seems more likely that it came from the Gulf of California. It has ten postnuclear whorls and measures: Length 11.6 mm., diameter 4.4 mm. The Academy of Natural Sciences, Philadelphia, has a specimen (Cat. no. 57870), collected by Colonel Jewett, at Mazatlan, Mexico, which has eight whorls and measures: Length 9.8 mm., diameter 4 mm. It is this specimen which has served for our figure.

Genus TURBONILLA Risso.

Turbonilla Risso, Hist. Nat. Eur. Mér., vol. 4, 1826, p. 224; *Euturbonilla* Semper, Arch. Nat. Fr. Meck., 1861, pp. 354–361. No type+*Elusa* A. Adams, Ann. Mag. Nat. Hist., 3d ser., vol. 6, 1861, p. 297. Type, *Elusa teres* A. Adams.

Shell with sinistral apex, cylindro-conic, many whorled, generally slender; with a single columellar fold which varies in strength and frequently is not visible in the aperture. The sculpture both axial and spiral ranges from obsolete to strongly incised lines or raised lamellæ.

Type.—Turbonilla typica Dall and Bartsch.

Of the twenty-four subgenera now recognized belonging to this genus, eleven occur on the west coast of America.

KEY TO THE SUBGENERA OF TURBONILLA.

- Shell with basal keel .... *Asmunda*, p. 129.
- Shell without basal keel.
  - Varices present .... *Mormula*, p. 110.
  - Varices absent.
    - Spiral sculpture absent, or if present, consisting of microscopic striations only.
      - Axial ribs strong.
        - Axial ribs between the sutures and on the base... *Turbonilla*, p. 29.
        - Axial ribs between the sutures only.............. *Chemnitzia*, p. 33.
      - Axial ribs feeble, usually only developed on the early whorls, *Ptycheulimella*, p. 59.
    - Spiral sculpture present, always stronger than microscopic striations.
      - Axial sculpture consisting of well-developed ribs.
        - Spiral markings consisting of very fine striations.
          - Aperture subquadrate.................... *Strioturbonilla*, p. 40.
          - Aperture suboval........................ *Pyrgolampros*, p. 59.
        - Spiral markings consisting of strongly incised lines.
          - Summits of the whorls strongly shouldered.
            - Spiral sculpture consisting of very fine incised lines, *Pyrgisculus*, p. 126.
            - Spiral sculpture consisting of incised grooves and cords of about equal strength.................. *Dunkeria*, p. 120.
          - Summits of the whorls not strongly shouldered.. *Pyrgiscus*, p. 74.
      - Axial sculpture reduced to mere raised threads...... *Careliopsis*, p. 130.

Subgenus **TURBONILLA** Risso, s. s.

Turbonilla Risso, Hist. Nat. Eur. Mer., vol. 4, 1826, p. 224. Type, *Turbonilla plicata* Risso. +*Euturbonilla* Semper (part), Arch. Nat. Fr. Meck., 1861, pp. 354–361. No type. +*Elusa* A. Adams, Ann. Mag. Nat. Hist., 3d ser., vol. 6, 1861, p. 297. Type, *Elusa teres* A. Adams.

Turbonillas without spiral sculpture, having prominent vertical ribs which extend from the summits of the whorls to the umbilical region; the same is true of the intercostal spaces. Usually both ribs and intercostal spaces are less strongly defined on the base below the periphery, than on the exposed portion of the whorls above it. Columella straight or slightly twisted. All our west coast forms belonging to this subgenus are small and slender, of semitranslucent bluish-white to milk-white color.

Type.—*Turbonilla typica* Dall and Bartsch=*T. plicata* Risso, 1826, not *Turbo plicatus* Brocchi, 1814.

KEY TO THE SPECIES OF THE SUBGENUS TURBONILLA.

- Whorls with a low rounded cord at the periphery.
  - Whorls strongly contracted at the suture.............................*gilli*, p. 29.
  - Whorls not strongly contracted at the sutures..............*delmontensis*, p. 30.
- Whorls without a cord at the periphery.
  - Summit of the whorls strongly tabulated........................*centrota*, p. 30.
  - Summit of the whorls not tabulated.
    - Intercostal spaces and ribs marked by fine crinkly axial sculpture..*ima*, p. 31.
    - Intercostal spaces and ribs not marked by fine crinkly axial sculpture.
      - Whorls overhanging....................................*diegensis*, p. 31.
      - Whorls not overhanging.
        - Shell large (adult 10 mm.).................................*acra*, p. 32.
        - Shell small (adult 6 mm. or less).
          - Axial ribs of penultimate whorl 30..............*lucana*, p. 32.
          - Axial ribs of penultimate whorl 22............*prolongata*, p. 33.

TURBONILLA (TURBONILLA) GILLI Dall and Bartsch.

Plate 2, fig. 8.

Turbonilla (*Turbonilla*) *gilli* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 493, 494, pl. 14, fig. 5.

Shell small, rather stout, inflated, dirty white. Nuclear whorls decollated, early post-nuclear whorls well rounded, later ones flat, broader at the summit than at the suture; sculpture of about fourteen strong, almost vertical, scalariform axial ribs on the second, and sixteen quite protractive ones on the succeeding whorls; on the penultimate turn, however, they are less oblique than on those preceding it. These ribs are very strongly developed at the summit of the whorls and render the deeply channeled suture decidedly coronated. Intercostal spaces deep, of about double the width of the ribs, interrupted suddenly at the decidedly angulated (almost keeled) periphery of the last whorl beyond which they reappear. Base strongly contracted, quite short, marked by the faint continuations of the axial ribs which extend to the umbilical region. Outer lip fractured; aperture? columella very strong, somewhat curved and revolute, provided with a subobsolete oblique fold.

The type and another specimen (Cat. no. 163009, U.S.N.M.) were collected by Mr. H. Hemphill at San Diego, California. The type has eight post-nuclear whorls, and measures: Length 3.3 mm., diameter 1.1 mm.

Two other lots belonging to the University of California have been examined—one, a single specimen, comes from station 30 off Catalina Island. The other three specimens were obtained at station 47, San Diego, California.

TURBONILLA (TURBONILLA) GILLI DELMONTENSIS Dall and Bartsch.

Plate 2, fig. 12.

Turbonilla (Turbonilla) gilli delmontensis DALL and BARTSCH, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 494, pl. 14, fig. 7.

Shell, similar to *T. gilli*, but much more stout and less turrited, with the ribs less strongly developed and the peripheral thickening only weakly represented. The type has lost the nuclear whorls, the eight remaining measure: Length 3.4 mm., diameter 1.2 mm.

Type.—Cat. no. 195921, U.S.N.M. was collected by Mr. S. S. Berry in 12 fathoms off Del Monte, Monterey, California.

TURBONILLA (TURBONILLA) CENTROTA, new name.

Plate 2, figs. 6, 6*a*.

=*Chemnitzia acuminata* C. B. ADAMS, Ann. Lyc. Nat. Hist. of N. Y., 1853, p. 388.
=*Chrysallida acuminata* C. B. ADAMS, Proc. Zool. Soc., 1863, p. 351. Not *Turbonilla acuminata* GOLDFUSS, =*Turritella acuminata* GOLDFUSS, 1852; nor *Chemnitzia acuminata* KEYSERLING 1846 (not a *Turbonilla*).

Shell very broadly conic, tabulatedly shouldered, milk-white. Nuclear whorls two and one-half, forming a decidedly elevated spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is slightly immersed. Post-nuclear whorls with decidedly tabulated summits, constricted at the sutures, well rounded, ornamented by strong, narrow, protractive axial ribs. Of these ribs 14 occur upon the first, 16 upon the second and third, 18 upon the fourth and fifth, and 20 upon the penultimate turn. Intercostal spaces a little more than twice as wide as the ribs, well impressed, terminating at the periphery. Sutures very strongly marked. Periphery and base of the last whorl well rounded, marked by the continuations of the axial ribs. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, somewhat curved and slightly revolute.

The specimen described is C. B. Adams's type and is registered as number 219 Amherst College. It is a mature specimen of seven post-nuclear whorls and measures: Length 2.8 mm., diameter 1.1 mm. It was collected at Panama.

TURBONILLA (TURBONILLA) IMA, new species.

Plate 2, fig. 1.

Shell large, elongate-conic, yellowish-white. (Early whorls eroded.) Those of the post-nuclear whorls remaining are very high between the sutures, slightly rounded, feebly shouldered at the summit, and somewhat contracted at the sutures, marked by low, rounded, somewhat sinuous, vertical axial ribs, of which there are 24 upon the penultimate whorl and 20 upon the second above it. Intercostal spaces about one and one-half times as wide as the ribs, shallow, scarcely depressed below the general surface. The intercostal spaces and ribs between the sutures are marked by rather strong lines of growth, which gives them a decidedly crinkly appearance. Sutures well impressed. Periphery and base of the last whorl well rounded, marked by the feeble continuations of the axial ribs. Aperture large; posterior angle acute; outer lip thin, showing the external markings within; columella slender, decidedly sinuous, not reflected.

The type (Cat. no. 123025 U.S.N.M.) has the last eight whorls which measure: Length 9.4 mm., diameter 2.2 mm. It was dredged at U. S. Bureau of Fisheries station 3392, in the Gulf of Panama, in 1270 fathoms on hard bottom, temperature 36.4°.

TURBONILLA (TURBONILLA) DIEGENSIS, new species.

Plate 2, fig. 13, 13*a*.

Shell small, subdiaphanous to dingy white. Nuclear whorls two and one-half, helicoid, loosely coiled, decidedly elevated, about one-fifth immersed, having their axis at a right angle to that of the later whorls. Post-nuclear whorls, moderately rounded, somewhat overhanging, the greatest convexity being on the lower third of the exposed portion of the whorls, traversed by 14 broad, coarse and strong, oblique, and somewhat flexuous axial ribs on the fourth and seventh whorl and 18 on the eighth. These ribs extend over the angulated periphery to the umbilical region, appearing fainter on the base; the deep intercostal grooves terminate at the periphery, i. e., do not appear on the base as gouged out spaces, as they do posterior to the periphery, but simply as plain shallow grooves between the ribs formed by the raising of these above the general surface of the shell. The whorls slope rapidly toward the suture and are somewhat contracted and shouldered at the summit, thus marking a prominent subchanneled suture. Aperture large, broadly ovate, showing the axial ribs within; outer lip thin, subpatulous, shortly curved to meet the short, somewhat revolute, slightly twisted, columella.

The type figured has ten post-nuclear whorls, and measures: Length 5.3 mm., diameter 1.7 mm. It comes from San Diego, California, and forms Cat. no. 130316, U.S.N.M. Cat. no. 10916, U.S.N.M., has two specimens from the same locality, while Cat. no. 163217, U.S.N.M., covers seventeen individuals from San Pedro, California. About twenty from the same place were identified for Mrs. Oldroyd. Cat. no. 195334, U.S.N.M., seven specimens from San Diego, California. Three individuals were dredged by the University of California, off San Diego, California.

TURBONILLA (TURBONILLA) ACRA, new species.

Plate 2, fig. 14.

Shell very long and slender, milk-white. (Nuclear whorls decollated.) Post-nuclear whorls high between the sutures, varying in outline, the first to eleventh being flattened, almost cylindric, with very strongly shouldered summits, the rest moderately well rounded, with less strongly shouldered summits. Axial ribs very strong on the first 11 whorls, less so and more rounded on the remaining. There are about 14 upon each of the first eleven turns, 22 upon the twelfth, 20 upon the thirteenth, fourteenth, and fifteenth, and about 30 much enfeebled and irregular ones upon the last turn, where they pass over the well-rounded periphery and base to the umbilical region. On the early turns the axial ribs terminate as strong, exserted cusps at the summit; on the last turns they are merely rounded. Early sutures strongly marked, later ones well impressed. Aperture ovate, posterior angle acute; outer lip thin; columella slender, almost straight, obliquely inserted.

The type (Cat. no. 206848 U.S.N.M.) has seventeen whorls, and measures: Length 10 mm., diameter 1.8 mm. It was collected off Catalina Island, California.

TURBONILLA (TURBONILLA) LUCANA, new species.

Plate 2, fig. 3.

Shell elongate-conic, milk-white. (Nuclear whorls decollated.) Post-nuclear whorls well rounded, slightly excurved at the summit, weakly shouldered, marked by slender, sinuous, retractive axial ribs, of which 20 occur upon the third, 22 upon the fourth and fifth, 26 upon the sixth and seventh, and 30 upon the penultimate whorl. Intercostal spaces a little narrower than the ribs, shallow, the depressed portion terminating at the periphery. Sutures well marked. Base moderately long, marked by the slender continuations of the axial ribs, which extend to the umbilical area. Aperture oval; posterior angle acute; outer lip thin, showing the external markings within; columella moderately strong, curved, reënforced by the attenuated base for two-thirds of its length and provided with a weak fold at its insertion.

The type (Cat. no. 4103, U.S.N.M.) was collected by J. Xantus at Cape St. Lucas, Lower California. It has nine post-nuclear whorls, which measure: Length 6 mm., diameter 1.5 mm.

TURBONILLA (TURBONILLA) PROLONGATA Carpenter.

Plate 2, fig. 18.

Chemnitzia prolongata CARPENTER, Cat. Mazatlan Shells, 1856, p. 429.

Shell small, very slender, bluish-white. Nuclear whorls small, two, forming a moderately elevated, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is one-third immersed. Post-nuclear whorls almost flat, rather high between the sutures, slightly contracted at the suture, and weakly shouldered at the summit, marked by well-rounded, slender, protractive axial ribs, of which 12 occur upon the first to fourth, 14 upon the fifth, 16 upon the sixth, 20 upon the seventh and eighth, 22 upon the ninth and the penultimate turn. Intercostal spaces not quite as wide as the ribs. Sutures well impressed, rendered slightly wavy by the axial ribs. Periphery of the last whorl well rounded. Base rather long, well rounded, marked by the continuation of the axial ribs, which extend to the slight umbilical chink. Aperture rather large, oval; somewhat expanded anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, somewhat revolute; parietal wall covered by a faint callus.

The type is on tablet 1995, Liverpool collection, in the British Museum, and comes from Mazatlan, Mexico, It has eleven post-nuclear whorls and measures: Length 5.37 mm., diameter 1.25 mm.

Subgenus CHEMNITZIA D'Orbigny.

Chemnitzia D'ORBIGNY, Hist. Nat. Iles Canaries, 1839, p. 77; + *Euturbonilla* SEMPER (part), Archiv. Nat. Fr. Meck., 1861, pp. 354-361; no type; + *Microbeliscus* SANDBERGER, Land u. Süssw. Conch. d. Vorwelt, 1874, p. 690; type, *Turbonilla* (*Microbeliscus*) *inaspectus* Fuchs.

Turbonillas without spiral sculpture, having prominent axial ribs which fuse or terminate at the periphery. The intercostal spaces are deep and sunken and terminate at or a little above the periphery, extending upward to the summits of the whorls. Base smooth, devoid of all sculpture. Columella straight. All our West American species belonging to this group are small, slender forms of semitranslucent bluish-white to milk-white color.

Type.—*Melania campanellæ* Philippi.

KEY TO THE SPECIES OF THE SUBGENUS CHEMNITZIA.

Adult shell more than 7 mm. long.
  Whorls well rounded.......................*hypolispa*, p. 34.
  Whorls flattened.......................*gabbiana*, p. 35.
Adult shell less than 7 mm. long.
  Summit of the whorls tabulated.
    Whorls strongly contracted at the suture.......................*apynoia*, p. 35.
    Whorls only slightly contracted at the suture.......................*muricata*, p. 36.

Adult shell less than 7 mm. long—Continued.
  Summit of the whorls not tabulated.
    Intercostal spaces terminating a little posterior to the suture.
      Whorls slopingly shouldered, summit appressed....... *santarosana*, p. 36.
      Whorls narrowly squarely shouldered, summit not appressed *paramœa*, p. 37.
    Intercostal spaces not terminating posterior to the suture.
      Axial ribs strongly protractive.......................... *houseri*, p. 37.
      Axial ribs not strongly protractive.
        Shell very slender, acicular.......................... *aculeus*, p. 38.
        Shell conic.
          Whorls narrowly equally shouldered at the summit.
            Axial ribs vertical...................... *muricatoides*, p. 38.
            Axial ribs protractive, sinuous .... *kelseyi*, p. 39.
          Whorls almost appressed at the summits........ *raymondi*, p. 39.

TURBONILLA (CHEMNITZIA) HYPOLISPA, new species.

Plate 2, figs. 5, 5*a*.

Shell broadly conic, yellowish-white. Nuclear whorls very small, two and one-half, forming a rather elevated helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is a little more than half immersed. Post-nuclear whorls well rounded, slightly shouldered at summit, marked by very strong, sublamellar, protractive axial ribs, of which 14 occur upon the second and third, 16 upon the fourth to eighth, 18 upon the ninth and tenth, 20 upon the eleventh, 24 upon the twelfth, and 25 upon the penultimate turn. On the early whorls these ribs are very strong in the middle, bending suddenly toward the summit, which gives them a decidedly angulated appearance a little below their termination; on the last three whorls they are more closely crowded and less strongly developed. Intercostal spaces about one and one-half times as wide as the ribs on the early whorls; on the last three they are about equal to them, well impressed, terminating a little above the sutures. Sutures well marked. Periphery of the last whorl slightly angulated. Base short, well rounded. Aperture rhomboidal; columella slender, somewhat curved, and slightly reflected.

The two cotypes (Cat. no. 206851, U.S.N.M.) were dredged by the University of California at station 43, off San Diego, California. One of these is a young specimen with the nucleus; the other has the last eleven whorls and measures: Length 8.1 mm., diameter 2 mm.

The University of California has another specimen from the same lot (Cat. no. 206852, U.S.N.M.), one specimen from San Diego. Cat. no. 205940, U.S.N.M., one specimen dredged by the University of California, at station 32, off Catalina Island; also two specimens dredged at stations 47 and 73, off San Diego.

TURBONILLA (CHEMNITZIA?) GABBIANA Cooper.

Chemnitzia gabbiana Cooper, Am. Journ. Conch., vol. 6, 1870, p. 66=*Turbonilla gracillima* Gabb, Proc. Cal. Acad. Sci., 1865, p. 186; not *Chemnitzia gracillima* Carpenter, Cat. Maz. Shells, 1856, p. 431; +*Turbonilla* (*Chemnitzia?*) *montereyensis* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 494–5.

Mr. Gabb's description is as follows:

> Shell small, very slender, long, white; vertex broken; whorls eleven or more, flattened on the sides; sutures strongly impressed, ribs about 23, large, obtuse, running from the suture to the margin of the base; base convexly truncated, smooth; aperture subcircular; columella thick. Length 10 mm., diameter 3.3 mm.
>
> Habitat, Monterey, California; Dr. J. G. Cooper, collector. This shell can be readily distinguished by its extremely slender form and the strong, slightly oblique ribs.

The type, according to Mr. Gabb, is in the collection of the California Geological Survey,[a] but appears to have been misplaced or lost. From the description we are led to believe that it is a form similar to *T. torquata*, but of considerably broader spire.

TURBONILLA (CHEMNITZIA) ÆPYNOTA, new species.

Plate 2, figs. 10, 10*a*.

Shell small, elongate-conic diaphanous. Nuclear whorls two and one-half, small, helicoid, forming a moderately elevated spire, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fifth immersed. Post-nuclear whorls high between the sutures, very strongly shouldered at the summits, somewhat contracted at the periphery, well rounded, marked by strong, sublamellar axial ribs that render the summits strongly crenulate. Sixteen of the axial ribs appear upon the first and second, 18 upon the third, fourth, and fifth, and 20 upon the remaining turns. Intercostal spaces a little wider than the ribs, deeply sunk below the general surface, extending to the suture on all the turns of the spire. Sutures strongly marked. Periphery of the last whorl feebly angulated. Base short, well rounded, smooth. Aperture rather large, subquadrate, posterior angle obtuse; outer lip thin, bent abruptly anteriorly toward the columella, which it joins almost at right angles; columella very slender and gently curved.

The type (Cat. no. 162443, U.S.N.M) has eight post-nuclear whorls and measures: Length 3.2 mm., diameter 0.9 mm. It was collected by Mr. F. W. Kelsey, in 30 fathoms, off San Martin Island, Lower California. Three additional specimens (Cat. no. 163242, U.S.N.M.) were collected by Mrs. Oldroyd, at San Pedro, California.

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[a] Proc. Cal. Acad. Sci., 1865, p. 183.

TURBONILLA (CHEMNITZIA) MURICATA Carpenter

Plate 2, fig. 9.

Chemnitzia muricata Carpenter, Cat. Maz. Shell, 1856, p. 428.

Shell elongate-conic, milk-white. Nuclear whorls three, forming an elevated helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is almost half immersed. Post-nuclear whorls moderately rounded, somewhat contracted at the suture, strongly shouldered at the summit, marked by very strong, slightly protractive axial ribs, of which 14 occur upon the first to fourth and 16 upon the remaining turns. These ribs extend prominently to the summit which they render muricated. Intercostal spaces as wide as the ribs, deeply impressed, terminating at the periphery. Sutures very strongly marked. Periphery and base of the last whorl well rounded, smooth. Aperture rhomboidal; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, slightly twisted and curved.

The type and four specimens were taken from *Spondylus* at Mazatlan, Mexico. The type and one other specimen are on tablet 1993, Liverpool collection, British Museum. It has seven post-nuclear whorls and measures: Length 2.3 mm., diameter 0.7 mm.

This shell, as far as the structure of the spire is concerned, strangely recalls *Turbonilla* (*Asmunda*) *turrita* of C. B. Adams. The base, however, is entirely different.

TURBONILLA (CHEMNITZIA) SANTAROSANA, new species.

Plate 2, figs. 7, 7*a*.

Shell small, delicate, subdiaphanous to milk-white. Nuclear whorls two and one-half, forming a moderately elevated helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is very slightly immersed. Post-nuclear whorls well rounded, slopingly shouldered near the summit, slightly constricted at the suture, marked by broad, low, rounded, axial ribs, which become somewhat flattened at the summit. Of these 16 occur upon the first to fourth, 18 upon the fifth and sixth, while upon the penultimate they are very much enfeebled and ill-defined. Intercostal spaces narrow, shallow, the depressed area terminating a little posterior to the suture. Sutures constricted. Periphery and base of the last whorl somewhat inflated. Aperture moderately large, rhomboidal; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella very thin and strongly curved.

The type and five specimens (Cat. no. 163239, U.S.N.M.) were dredged at U. S. Bureau of Fisheries station 2902, in 53 fathoms, temperature 45°, off Santa Rosa Island, California. The type has eight and one-half post-nuclear whorls and measures: Length 4.5 mm., diameter 1.4 mm. Six specimens (Cat. no. 163240, U.S.N.M), were dredged at U. S. Bureau of Fisheries station 2901 in 48 fathoms, temperature 55°.1, off Santa Rosa Island. Four specimens were obtained by the University of California, at station 81, off San Diego, and another individual at station 19, off Newport, California.

TURBONILLA (CHEMNITZIA) PARAMŒA, new name.

Plate 2, figs. 4, *4a*.

Chemnitzia similis C. B. ADAMS, Ann. Lyc. of Nat. Hist. N. Y., vol. 5, 1852, pp. 392–393.

Shell elongate-conic, milk-white. (Nuclear whorls decollated.) Post-nuclear whorls strongly rounded, roundly shouldered at the summit, marked by moderately strong, rounded, protractive axial ribs, of which 16 occur upon the first, 18 upon the second and third, 20 upon the fourth to seventh, 22 upon the eighth and the penultimate whorl. Intercostal spaces a little wider than the ribs, terminating a little above the sutures. Sutures constricted. Periphery and the short base of the last whorl well rounded. Aperture (defective); columella stout, somewhat sinuous.

The above description is based upon Professor Adams's type, which has lost the nucleus and early whorls. The ten remaining measure: Length 5.9 mm., diameter 1.5 mm. It comes from Panama.

This species resembles *Turbonilla* (*Strioturbonilla*) *panamensis* C. B. Adams, but differs in having the whorls more rounded, fewer and less strongly developed ribs and more constricted sutures.

TURBONILLA (CHEMNITZIA) HOUSERI, new species.

Plate 2, figs. 15, *15a*.

Shell small, elongate-conic, milk-white. Nuclear whorls two and one-fourth, forming an elevated helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls strongly rounded, slightly shouldered at the summit, marked by strong, sublamellar, decidedly protractive axial ribs, which are so arranged as to practically form continuous oblique lines, from whorl to whorl. Of these ribs 14 appear upon the first to third, 16 upon the fourth and fifth, and 18 upon the remaining whorls. Intercostal spaces about as wide as the ribs, deeply impressed. Sutures somewhat constricted. Periphery of the last whorl and base well rounded. Aperture rhomboidal; outer lip thin, columella moderately strong, slightly curved and slightly reflected.

The two cotypes (Cat. no. 206853, U.S.N.M.) were dredged at U. S. Bureau of Fisheries station 2813, in 40 fathoms, bottom temperature 81°, on coral sand bottom, off Galapagos Islands. One of these is a young individual from which our description of the nucleus and early whorls was taken. The other has lost the nucleus, the nine remaining whorls measure: Length 3.7 mm., diameter 1.1 mm.

Named for Prof. G. L. Houser.

TURBONILLA (CHEMNITZIA) ACULEUS C. B. Adams.

Plate 2, figs. 2, 2*a*.

Chemnitzia aculeus C. B. Adams, Ann. Lyc. Nat. Hist. of N. Y., vol. 5, 1852, p. 388.

Shell very slender, elongate-conic, subdiaphanous to milk-white. Nuclear whorls small, two and one-half, forming a small elevated helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls slightly rounded, weakly shouldered at the summit, marked by low, rounded, somewhat sinuous, protractive axial ribs, of which 14 occur upon the first to third, 16 upon the fourth and fifth, 18 upon the sixth to eighth, 20 upon the ninth, 22 upon the tenth, and 25 upon the penultimate turn. Intercostal spaces about as wide as the ribs, well impressed, terminating at the sutures. Sutures well marked. Periphery and base of the last whorl well rounded, smooth, excepting faint lines of growth. Aperture small, rhomboidal; outer lip thin, showing the external markings within; columella oblique, almost straight, strongly reënforced by the base.

The above description is based upon Professor Adams's types; one a young specimen, of six and one-half whorls, has a little more perfect nucleus than the adult shell; the latter has twelve post-nuclear whorls and measures: Length 4.4 mm., diameter 1 mm. They come from Panama.

TURBONILLA (CHEMNITZIA) MURICATOIDES Dall and Bartsch.

Plate 2, figs. 11, 11*a*.

Turbonilla (*Chemnitzia*) *muricatoides* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 495, pl. 14, figs. 2, 2*a*.

Shell small, slender, subdiaphanous to milk white; nuclear whorls two and one-half, helicoid but slightly elevated, well rounded, having their axis at right angles to the axis of the post-nuclear turn. Post-nuclear whorls smooth, rather high between the sutures, moderately rounded, marked by strong sublamellar axial ribs, which are about half as wide as the spaces that separate them, and extend strongly to the very summit of the whorl where they render the well-marked sutures crenulate. There are 14 of these ribs upon the first, 18 upon the fifth, and 20 upon the penultimate turn. The depressed intercostal spaces terminate abruptly at the periphery. Base of the last whorl well rounded, smooth, without sculpture. Aperture: (outer lip fractured), columella slender, slightly twisted.

The type has seven post-nuclear turns and measures: Length 3 mm., diameter 1 mm. It is Cat. no. 195942, U.S.N.M., and comes from Monterey, California. Another specimen (Cat. no. 160488, U.S.N.M.) was collected by Doctor Dall at the same place.

TURBONILLA (CHEMNITZIA) KELSEYI, new species.

Plate 2, figs. 16, 16*a*.

Shell small, semitransparent. Nuclear whorls small, two and one-fourth, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fifth immersed. Post-nuclear whorls moderately rounded, ornamented by somewhat sinuous, slightly protractive, rounded axial ribs, which are lower and somewhat expanded at the slightly shouldered summits of the whorls; 14 of these appear upon the third, 16 upon the fourth, 18 upon the fifth, 20 upon the sixth and seventh, 22 upon the eighth, and 24 upon the penultimate post-nuclear whorl of the type. Intercostal spaces only moderately impressed, about as wide as the ribs. Sutures well impressed. Periphery of the last whorl well rounded. Base moderately long, well rounded. Aperture suboval, posterior angle obtuse; outer lip thin, showing the external sculpture within; columella short, stout, twisted, provided with a weak fold at its insertion.

The type (Cat. no. 46506, U.S.N.M.) comes from San Diego, California. It has lost the nucleus and probably the first two post-nuclear turns, and measures: Length 4.7 mm., diameter 0.9 mm. The nuclear whorls were described from a specimen of lot Cat. no. 56789, U.S.N.M.

The following specimens have been examined:

U.S.N.M. Cat. no.	No. of specimens.	Depth, fathoms.	Locality.	Disposition of material.
56789	3	....	Santa Barbara, California	U. S. Nat. Mus.
152197	22	....	San Pedro, California	Do.
152314	2	10	Ocean Beach, San Diego, California	Do.
60916	2	....	San Diego, California	Do.
162435	1	....	Pacific Beach, San Diego, California	Do.
46503	2	....	Todos Santos Bay, Lower California	Do.
106513	2	....	Point Abreojos, Lower California	Do.
162432	1	....	San Ignacio, Lower California	Do.

Named for Prof. F. W. Kelsey.

TURBONILLA (CHEMNITZIA) RAYMONDI, new species.

Plate 2, figs. 17, 17*a*.

Shell acicular, milk-white. Nuclear whorls small, two and one-half, forming a low, helicoid spire, the axis of which is almost at right angles to that of the succeeding turns, in the first of which the nuclear spire is about one-fifth immersed. Post-nuclear whorls well rounded, increasing very regularly in size, high between the sutures, almost appressed at the summit and ornamented by well-developed, rounded, axial ribs, of which there are 16 upon the second and third, 18 upon the fourth, 20 upon the fifth to eighth, 22 upon the ninth and penultimate whorls. Intercostal spaces deep, about one and one-half times as wide as the ribs. Sutures strongly impressed, rendered slightly wavy by the ribs. Periphery of the last whorl angulated. Base short, well rounded. Aperture subquadrate. Columella short, slightly curved and somewhat oblique.

The type (Cat. no. 206849, U.S.N.M.) was dredged off Catalina Island. It has eleven postnuclear whorls and measures: Length 6.2 mm., diameter 1.6 mm. Another specimen from the same locality is in the University of California, which also has a specimen dredged off San Diego. Cat. no. 163252a, U.S.N.M., contains a specimen dredged at U. S. Bureau of Fisheries station 2901, off Santa Rosa Island, in 48 fathoms. Cat. no. 206850, U.S.N.M., contains another specimen from San Diego, California.

Named for Prof. William J. Raymond.

Subgenus **STRIOTURBONILLA** Sacco.

Strioturbonilla Sacco, I Moll. del Piemonte e della Liguria, 1892, p. 94.

Shell as in *Turbonilla* and *Chemnitzia* but finely and closely spirally striated on the spire and base.

Type.—*Strioturbonilla alpina* Sacco.

All our West American species, with the exception of *T. affinis* and *T. smithsoni*, are of blueish-white to milk-white color; the two exceptions being of a yellowish cast.

KEY TO THE SPECIES OF THE SUBGENUS STRIOTURBONILLA.

Spiral striations extending uniformly over the axial ribs and intercostal spaces between the sutures.
  Intercostal spaces terminating posterior to the periphery, having a plain, smooth band in the suture.
    Intercostal spaces pinched in to form a step immediately below the summit...*stephanogyra*, p. 42.
    Intercostal spaces not pinched in at the summit.
      Axial ribs exceedingly protractive.
        Axial ribs straight.................................*panamensis*, p. 42.
        Axial ribs sinuous.......................................*buttoni*, p. 43.
      Axial ribs moderately protractive.
        Whorls overhanging.
          Axial ribs 10–18..........................*vancouverensis*, p. 44.
          Axial ribs 14–22...................................*asser*, p. 45.

- Spiral striations extending uniformly over the axial ribs and intercostal spaces between the sutures—Continued.
  - Intercostal spaces terminating posterior to the periphery, having a plain, smooth band in the suture—Continued.
    - Intercostal spaces not pinched in at the summit—Continued.
      - Axial ribs moderately protractive—Continued.
        - Whorls not overhanging.
          - Intercostal spaces 4 times as wide as the ribs....*mexicana*, p. 45.
          - Intercostal spaces less than 3 times as wide as the ribs.
            - All post-nuclear whorls well rounded.
              - Axial ribs poorly developed..............*attrita*, p. 46.
              - Axial ribs well developed.
                - Spiral striations strong...............*nicholsi*, p. 46.
                - Spiral striations microscopic.
                  - Axial ribs 16–22...............*torquata*, p. 47.
                  - Axial ribs 16–28.................*stylina*, p. 48.
            - Early post-nuclear whorls well rounded, later ones flattened....................................*calvini*, p. 48.
      - Axial ribs vertical or nearly so.
        - Axial ribs much enfeebled on the last whorl........*carpenteri*, p. 49.
        - Axial ribs strong upon all the whorls.
          - Axial ribs 16...................................*simpsoni*, p. 49.
          - Axial ribs 16–22............................*profundicola*, p. 50.
    - Intercostal spaces extending to the suture.
      - Shell very robust......................................*galianoi*, p. 51.
      - Shell not robust.
        - Shell broadly conic.
          - Shell large, length 6 mm..........................*humerosa*, p. 52.
          - Shell small, length less than 4 mm ....*c—b—adamsi*, p. 52.
        - Shell slender.
          - Axial ribs extending over the base.................*serræ*, p. 53.
          - Axial ribs not extending over the base.
            - Axial ribs 14–21............................*aresta*, p. 54.
            - Axial ribs 14–16............................*pazana*, p. 54.
- Spiral striations confined to the intercostal spaces between the sutures.
  - Spiral striations only two between the sutures...............*galapagensis*, p. 55.
  - Spiral striations more than two between the sutures.
    - Intercostal spaces uniformly spirally striated...................*undata*, p. 55.
    - Intercostal spaces not uniformly spirally striated.
      - Intercostal spaces marked by a peripheral line of pits and numerous striations.
        - Intercostal spaces less wide than the ribs...............*affinis*, p. 56.
        - Intercostal spaces wider than the ribs.
          - Spiral striations between the sutures 16..........*phanea*, p. 56.
          - Spiral striations between the sutures 24........*imperialis*, p. 57.
      - Intercostal spaces marked by a peripheral and a submedian line of pits and numerous fine striations.
        - Fine striations between median pits and summit 40..*smithsoni*, p. 57.
        - Fine striations between median pits and summit 20...*gracilior*, p. 58.

TURBONILLA (STRIOTURBONILLA) STEPHANOGYRA, new species.

Plate 3, figs. 8, *8a*.

Shell elongate-conic, milk-white. Nuclear whorls three, forming a well-elevated spire, the axis of which is at right angles to that of the succeeding turns, in the first of which they are about one-fifth immersed. Post-nuclear whorls decidedly flattened, with strongly beveled shoulders, marked by strong, almost cylindrical, narrow, well rounded, vertical axial ribs, of which 14 occur upon the first to third, 16 upon the fourth to sixth, and 18 upon the remaining turns. Intercostal spaces about twice as wide as the ribs, well impressed, with a decidedly pinched-in area near the summit, which gives this part of the shell a step-like aspect. Sutures well marked. Periphery and base of the last whorl well rounded. Entire surface of spire and base marked by exceedingly fine, closely spaced, spiral striations. Aperture rhomboidal, rather long; outer lip thin, showing the external sculpture within; columella slender, almost straight.

The type (Cat. no. 162440 U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2799, in 29½ fathoms, in the bay of Panama. It has ten post-nuclear whorls, and measures: Length 4.8 mm., diameter 1.3 mm.

TURBONILLA (STRIOTURBONILLA) PANAMENSIS C. B. Adams.

Plate 3, figs. 12, *12a*.

Chemnitzia panamensis C. B. Adams, Ann. Lyc. Nat. Hist. of N. Y., vol. 5, 1852, p. 392.

Shell with the sides of the spire forming a straight line, light yellow. Nuclear whorls small, two and two-thirds, forming a quite elevated spire, the axis of which is at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls rather low between the sutures, decidedly flattened and slightly shouldered at the summit, marked by strong, rounded, very protractive axial ribs, which are of equal strength from the summit to the periphery, of these 16 occur upon the first seven whorls, 18 upon the eighth, 20 upon the ninth, 22 upon the tenth, and 25 upon the penultimate turn. Intercostal spaces about as wide as the ribs, terminating a little above the sutures. Sutures well impressed, rendered slightly sinuous by the ribs. Periphery of the last whorl and the moderately long base, somewhat inflated and well rounded. Entire surface of base and spire marked by very fine closely spaced spiral striations. Aperture pear-shaped; posterior angle acute; outer lip thin, showing the external sculpture within; columella strong, almost straight, decidedly revolute, reënforced for half its length by the base.

The Amherst collection contains a tube with six specimens; one of these is a splendid individual which undoubtedly served Professor Adams for his diagnosis. We have used it for our description and figure. It has twelve post-nuclear whorls, and measures: Length 5.5 mm., diameter 1.5 mm. They came from Panama.

TURBONILLA (STRIOTURBONILLA) BUTTONI, new species.

Plate 3, figs. 4, *4a*.

Shell irregularly elongate-conic, yellowish-white. Nuclear whorls two, very small, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are very slightly immersed. Post-nuclear whorls slightly rounded, ornamented by very regular, rounded, somewhat sinuous, and decidedly protractive axial ribs, which extend undiminished from the summit to the periphery of the whorls and very feebly beyond this on the base. There are 16 of these ribs upon the first to third, 18 upon the fourth and fifth, 20 upon the sixth to ninth, and 22 upon the penultimate turn. Intercostal spaces well impressed, about as wide as the ribs. Sutures well marked, rendered wavy by the strong ribs. Periphery of the last whorl well rounded. Base short, well rounded. Entire surface of spire and base marked by numerous exceedingly fine wavy spiral striations. Aperture subquadrate, posterior angle obtuse; outer lip thin; columella short, moderately strong, slightly twisted and reflected, provided with a weak oblique fold at its insertion.

The type (Cat. no. 163241 U.S.N.M.) and nine specimens were collected at San Pedro, California. It has eleven post-nuclear whorls, and measures: Length 6.3 mm., diameter 1.5 mm.

The following additional specimens have been examined:

U.S.N.M. cat. no.	No. of specimens.	U. S. B. F. station.	Depth, fathoms.	Locality.
163246	1	2,901	48	Off Santa Rosa Island, California.
56867	2			Do.
205938	2			San Pedro, California.
205939	12			Do.
203245*a*	5			Do.
Berry coll	2			Do.
160491	2			San Diego, California.
152314*a*	1			Do.
Delos Arnold coll	2			Do.
162436	1			Catalina Island, California.
106513	3			Point Abreojos, Lower California.
56358	2			Todos Santos Bay, Lower California.
46503	3			Do.

Named for Fred L. Button.

TURBONILLA (STRIOTURBONILLA) VANCOUVERENSIS Baird.

Plate 4, fig. 9.

Chemnitzia vancouverensis Baird, Proc. Zool. Soc., 1863, p. 67. *Turbonilla* (*Strioturbonilla*) *vancouverensis* (Baird), Dall, and Bartsch, Proc. U. S. Nat. Mus., vol. 30, 1907, pp. 495–496, pl. 44, fig. 1.

Shell solid, rather broad and stout, subdiaphanous, bluish to milk-white. Nuclear whorls two, large, helicoid, partly obliquely immersed in the first of the later turns. Post-nuclear whorls well rounded, with the greatest convexity on the lower half of the exposed portion; ornamented by about 10 very broad, strong, slightly protractive axial ribs on the second, 14 on the fifth, 16 on the eighth, and 18 on the penultimate whorl. These ribs terminate before they reach the periphery of the whorl, leaving a plain band above the suture, as in *T. torquata* Gould, but not as broad as in that species. Intercostal spaces deep, narrower than the ribs. Sutures well marked by the shouldering at the summit and the sudden sloping of the ribs just above the periphery of the whorls. Aperture subovate; lip thin, joining the short, somewhat revolute columella in an even curve. Entire surface marked by faint, wavy, spiral striations. The specimen figured has 10 post-nuclear whorls, and measures: Length, 6 mm.; diameter, 1.8 mm.

Another specimen from the same locality, which has 12 post-nuclear whorls but is minus the nucleus and probably the first of the succeeding turns, measures: Length, 9.2 mm.; diameter, 2.5 mm.

This species resembles *T. torquata* Gould, but can easily be distinguished from it by its broader base, its large, partly immersed, slanting nucleus, and the robust character of its whorls and ribs, the latter being fewer and much broader; the intercostal spaces being comparatively narrower. Baird's cotypes, three specimens, were taken from the crop of a pintail duck shot in Esquimalt Harbor, Vancouver Island, British Columbia; they are in the British Museum.

The following specimens have been examined:

U.S.N.M. cat. no.	No. of specimens.	Locality.	Depth, fathoms.	Collector.	Disposition of material.
169489	2	Kadiak Island, Alaska	13	W. H. Dall	U. S. Nat. Mus.
160490	1	Lituya Bay, Alaska	8	do	Do.
160993	1	Port Etches, Alaska		do	Do.
126670	4	Victoria, Vancouver Island, British Colombia.		C. F. Newcombe	Do.
44938	1	Puget Sound, Washington.		C. B. Kennerley	Do.
196184	1	Carter Bay, British Columbia.		G. W. Taylor.	Do.
	1	do		do	Taylor coll.
196183	3	Port Simpson, British Columbia.		do	U. S. Nat. Mus.
	11	do		do	Taylor coll.
	2	West of Rose Spit, Queen Charlotte Island, British Columbia.		do	Do.
	1	Alert Bay, British Columbia.		do	Do.
	20	Departure Bay, British Columbia.		do	Do.
196185	5	do		do	U. S. Nat. Mus.

TURBONILLA (STRIOTURBONILLA) ASSER, new species.

Plate 3, figs. 1, 1*a*.

Shell elongate-conic, milk-white. Nuclear whorls small, two, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-third immersed. Post-nuclear whorls well rounded, slightly overhanging, ornamented by well developed, somewhat sinuous, rounded, protractive axial ribs, of which there are about 14 upon the third, 16 upon the fourth and fifth, 18 upon the sixth to eighth, 20 upon the ninth to eleventh, and 22 upon the twelfth and penultimate turns. Intercostal spaces almost equal to the ribs in width, shallow, terminating some little distance posterior to the summit of the succeeding whorl, thus leaving a rather broad, plain band above the suture in each turn. Sutures strongly constricted. Periphery of the last whorl well rounded. Base short, well rounded. Entire surface of spire and base marked by very fine, closely spaced, spiral striations. Aperture subquadrate. Posterior angle obtuse, outer lip thin, showing the external markings within, columella slender, well curved and slightly revolute.

The type and a young specimen (Cat. no. 205932, U.S.N.M.) from which the nucleus has been described, come from off Redondo, California. The type has lost the nucleus and first post-nuclear whorl. The thirteen remaining whorls measure: Length, 8.3 mm.; diameter, 1.9 mm. Two additional specimens (Cat. no. 205933, U.S.N.M.) come from San Pedro, California. Two more (Cat. no. 163244, U.S.N.M.) are also from the same locality.

TURBONILLA (STRIOTURBONILLA) MEXICANA, new species.

Plate 3, figs. 5, 5*a*.

Shell broadly conic, yellowish-white. Nuclear whorls two and one-half, forming a decidedly elevated helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is slightly immersed. Post-nuclear whorls well rounded, appressed at the summit, marked by slender protractive axial ribs, of which 16 occur upon the first and second, 14 upon the third and fourth, and 16 upon the remaining whorls. Intercostal spaces well impressed, at least four times as wide as the ribs, terminating a little distance posterior to the suture, marked by many very fine, closely spaced spiral striations, which do not appear to extend over the ribs. Sutures well impressed. Periphery of the last whorl somewhat angulated. Base short, well rounded, marked only by exceedingly fine, spiral striations. Aperture large, subquadrate, posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, slightly curved and somewhat revolute.

The type (Cat. no. 162515, U.S.N.M.) and three additional specimens were dredged at U. S. Bureau of Fisheries station 2830, in 66 fathoms, temperature 74°.1, off Lower California. The type is not quite mature; it has nine post-nuclear whorls, and measures: Length, 4.5 mm.; diameter, 1.3 mm.

The following specimens have been examined:

U.S.N.M. cat. no.	No. of specimens.	U.S.B.F. station.	Locality.	Depth, fathoms.	Temperature, degrees.	Disposition of material.
162515	4	2830	Off Lower California	66	74.1	U. S. Nat. Mus.
96561	5	2830	do	66	74.1	Do.
163253	4	2823	Off La Paz, Lower California.	26½		Do.
191566	1	2826	do	9½		Do.

TURBONILLA (STRIOTURBONILLA) ATTRITA, new species.

Plate 4, figs. 11, 11*a*.

Shell slender, elongate-conic, bluish-white. Nuclear whorls small, two and one-half, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are slightly immersed. Post-nuclear whorls very high between the sutures, almost flattened, ornamented with very low, flattened, somewhat irregular, protractive axial ribs, which are best developed on the early whorls. Of these there are 18 upon the second, 22 upon the third, 18 upon the fourth and fifth, 22 upon the sixth, 18 upon the seventh, 20 upon the eighth and ninth; on the next turn they become quite enfeebled, and on the penultimate turn they are obsolete. Intercostal spaces about half as wide as the ribs and very shallow. Sutures well impressed. Periphery of the last whorl well rounded. Base short, somewhat inflated. Entire surface of the spire and base marked by numerous very fine, wavy spiral striations. Aperture broadly oval; posterior angle acute; outer lip thin; columella short, slender, somewhat curved, and slightly reflected.

The type and six individuals (Cat. no. 163248, U.S.N.M.) come from San Pedro, California. The type has twelve post-nuclear whorls and measures: Length 7.4 mm., diameter 1.6 mm. Cat. no. 163243, U.S.N.M., contains five specimens from San Pedro, California. Another specimen (Cat. no. 152314, U.S.N.M) comes from San Diego, California. Another specimen in Mr. Berry's collection is from Long Beach, California.

TURBONILLA (STRIOTURBONILLA) NICHOLSI, new species.

Plate 3, fig. 2.

Shell large and robust, milk-white. (Nuclear whorls decollated.) Post-nuclear whorls well rounded, slightly shouldered at the summit, marked by strong, somewhat sinuous, decidedly protractive axial ribs, of which 14 occur upon the first, 16 upon the second to sixth, 18 upon the seventh, 20 upon the eighth, 22 upon the ninth, and 25 upon the penultimate turn. Intercostal spaces almost as wide as the ribs, well impressed, terminating a little distance posterior to the suture. Sutures strongly marked. Periphery and rather long base of the last whorl well rounded, marked by the feeble continuations of the axial ribs. Entire surface of base and spire marked by numerous, strongly incised spiral striations, of which those on the spire somewhat exceed the ones on the base in strength. Aperture large, oval; outer lip thin, showing the external sculpture within; columella slender, sigmoid, slightly reflected.

The type (Cat. no. 160210, U.S.N.M.) was collected by Lieutenant Nichols in the Gulf of California. It has lost the nucleus. The twelve remaining whorls measure: Length 8.8 mm., diameter 2.4 mm.

TURBONILLA (STRIOTURBONILLA) TORQUATA Gould.

Plate 4, figs. 15, 15*a*.

Chemnitzia torquata Gould, Bost. Journ. Nat. Hist., vol. 4, 1852, p. 384, pl. 14, fig. 16; not *Turbonilla* (*Strioturbonilla*) *torquata* (Gould) Dall and Bartsch, Mem. Cal. Acad. Sci., vol. 3, 1903, pp. 271, 272, pl. 2, figs. 4, 4a, which may take the name *Turbonilla* (*Strioturbonilla*) *ralphi* Dall and Bartsch.

Shell robust, bluish-white. Nuclear whorls small, two, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fifth immersed. Postnuclear whorls well rounded, ornamented by strongly elevated, slightly protractive axial ribs, of which 16 occur upon all of the whorls except the penultimate, which has 22. Intercostal spaces about twice as wide as the ribs, terminating a little above the summit of the preceding whorl, thus leaving a narrow, plain band in the suture. Sutures strongly impressed. Periphery of the last whorl well rounded. Base moderately long, well rounded. Entire surface of spire and base crossed by numerous very fine, closely spaced, wavy, spiral striations. Aperture suboval, outer lip thin, showing the external sculpture within. Columella slender, decidedly curved, and somewhat reflected.

The specimen described and figured (Cat. no. 205934, U.S.N.M.) has lost the nucleus. The eleven remaining whorls measure: Length 6.5 mm., diameter 2.1 mm., and comes from off Point Firmin, California. Another specimen (Cat. no. 60916, U.S.N.M.) comes from San Diego, California. Still another (Cat. no. 205935, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 4322, in 110 to 197 fathoms, off La Jolla, California. Two additional specimens in the University of California collection were obtained at their stations 22 and 28 off San Diego. Mr. Berry's collection contains two specimens dredged in 40 fathoms off Catalina Island, California.

TURBONILLA (STRIOTURBONILLA) STYLINA Carpenter.

Plate 3, figs. 7, 7*a*.

Chemnitzia (*?torquata* var.) *stylina* Carpenter, Ann. Mag. Nat. Hist., 3d ser., vol. 15, 1865, p. 396. *Turbonilla* (*Strioturbonilla*) *torquata stylina* Dall and Bartsch, Mem. Cal. Acad. Sci., vol. 3, 1903, p. 272, in part. *Turbonilla* (*Strioturbonilla*) *stylina* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 497, pl. 44, figs. 11, 11a.

Shell slender, subdiaphanous to milk-white. Nuclear whorls two, smooth, depressed, helicoid, scarcely extending beyond the outline of the spire and having their axis at right angles to the axis of the succeeding turns. Post-nuclear whorls well rounded, separated by strongly constricted sutures, rather high, ornamented by rather low, broad, rounded, sinuous, protractive axial ribs, of which there are 16 upon the first, 20 upon the fifth, and 28 upon the penultimate turn. Intercostal spaces moderately depressed, about as wide as the ribs, terminating a short distance above the sutures, thus leaving a narrow, smooth band between the termination of the ribs and the suture as in *T.* (*Strioturbonilla*) *torquata* Gould, but not quite as wide as in that species. Periphery of the last whorl well rounded. Base rather short, well rounded. Entire surface marked by very fine, wavy spiral striations. Aperture subovate, outer lip thin; columella slender, moderately long, slightly twisted, almost vertical. The specimen described and figured (Cat. no. 56429, U.S.N.M.) was collected by Doctor Dall in 8 or 10 fathoms at Monterey, California. It has 11 post-nuclear whorls and measures: Length 6.5 mm., diameter 1.7 mm. (not 8 and 1.9 mm., as erroneously stated in the last-cited reference). Another specimen was dredged in 12 fathoms off Del Monte, Monterey, by Mr. S. S. Berry (Cat. no. 165199, U.S.N.M.). Two specimens (Cat. no. 163249, U.S.N.M.), both immature, dredged by the Bureau of Fisheries steamer *Albatross* at station 2932 in 50 fathoms off Coronado Island, are provisionally referred to this form.

TURBONILLA (STRIOTURBONILLA) CALVINI, new species.

Plate 4, figs. 1, 1*a*.

Shell elongate-conic, milk-white. Nuclear whorls two and three-fourths, forming a decidedly elevated helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Early post-nuclear whorls strongly rounded, decidedly shouldered at the summit, and constricted at the sutures. Later ones flattened in the middle, less shouldered and less contracted. Axial ribs strong, sublamellar, shouldered a little below the summit; 14 upon the first to ninth, 16 upon the tenth, and 18 upon the penultimate turn. Intercostal spaces about two and one-half times as wide as the ribs, well impressed, a little more so on the shoulder than on the summit, which gives them a contracted appearance at this place, terminating a little above the suture. Sutures well impressed. Entire surface of base and spire marked by fine, wavy, spiral striations. Periphery and the moderately long base of the last whorl well rounded. Aperture rhomboidal; outer lip thin, showing the external sculpture within; columella moderately strong, slightly curved.

The two cotypes and four additional specimens (Cat. no. 162442, U.S.N.M.) were dredged by the U. S. Bureau of Fisheries, at station 2823, in 26½ fathoms off La Paz, Lower California. One of the cotypes has the nucleus and nine post-nuclear whorls, and measures: Length 3.1 mm., diameter 0.9 mm. The other cotype consists of the last seven post-nuclear whorls; if perfect, it would probably have had twelve. This measures: Length 3.6 mm., diameter 1.2 mm.

Named for Prof. Samuel Calvin.

TURBONILLA (STRIOTURBONILLA) CARPENTERI, new species.

Plate 3, figs. 9, *9a*.

Shell long, slender, bluish-white. Nuclear whorls small, two and one-half depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fifth immersed. Post-nuclear whorls exceedingly high between the sutures, evenly rounded, marked by almost vertical axial ribs, which become slightly expanded and flattened at the summits. There are 18 of these ribs upon the first to third, 20 upon the fourth to sixth, 22 upon the seventh, 24 upon the eighth and ninth, and 26 upon the tenth. Upon the penultimate turn they become decidedly irregular and enfeebled. Intercostal spaces about one-half as wide as the ribs, but little depressed below the general surface of the shell. Sutures somewhat constricted. ` Periphery of the last whorl well rounded. Base short and somewhat inflated, marked by feeble extensions of the axial ribs. Entire surface of spire and base crossed by numerous fine, wavy, spiral striations. Aperture subquadrate, rather elongated, posterior angle obtuse, outer lip thin; columella rather long, slender, slightly sinuous.

The type (Cat. no. 160065, U.S.N.M.) has twelve post-nuclear whorls, and measures: Length 7.9 mm., diameter 1.7 mm., and was collected at San Pedro, California. Two specimens from the same locality were identified for Mrs. Oldroyd.

Named for Doctor P. P. Carpenter.

TURBONILLA (STRIOTURBONILLA) SIMPSONI, new species.

Plate 3, figs. 6, *6a*.

Shell elongate-conic, rather slender, bluish-white. Nuclear whorls two and three-fourths, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls well rounded, marked by very strong, well raised, almost vertical axial ribs, of which 16 occur upon all the whorls of the type. These ribs are strongest in the middle and slightly lower at the summit and periphery. Intercostal spaces deeply impressed, equaling the ribs in width, terminating a very little posterior to the suture. Sutures somewhat constricted. Periphery of the last whorl well rounded. Base rather short, well rounded. Entire surface of spire and base marked by fine, wavy, spiral striations. Aperture subquadrate, posterior angle obtuse: outer lip thin, showing the external sculpture within; columella short, slender, and oblique.

The type (Cat. no. 152750, U.S.N.M.) has lost the nucleus and probably the first one and one-half post-nuclear turns; the 12 remaining measure: Length 6.7 mm., diameter 1.6 mm. It and another specimen, listed under the same number, were collected in 10 fathoms off San Pedro, California.

The following specimens have been examined:

U.S.N.M. cat. no.	No. of specimens.	Univ. Cal. station.	Locality.	Depth, fathoms.	Disposition of material.
152750	2	....	Off San Pedro, California............	10	U. S. Nat. Mus.
163247	4	....	.....do..............................	....	Do.
122750	1	....	.....do..............................	....	Do.
	6	....	.....do..............................	....	Oldroyd coll.
152314*b*	1	....	San Diego, California................	....	U. S. Nat. Mus.
205941	2	....	.....do..............................	....	Do.
	4	12	Off Redondo, California..............	....	Univ. Cal. coll.
	1	27	Off Catalina Island, California......	....	Do.
	5	32	.....do..............................	....	Do.
	1	47	Off Long Beach, California...........	....	Do.

Named for Charles T. Simpson.

TURBONILLA (STRIOTURBONILLA) PROFUNDICOLA, new species.

Plate 3, figs. 11, 11*a*.

Shell elongate-conic, milk-white, shining. Nuclear whorls very small, two and one-half, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are but very slightly immersed. Post-nuclear turns well rounded, very slightly shouldered at the summit, marked by gently protractively curved, low, rounded, well-developed axial ribs, of which 16 occur upon the first three whorls, 18 upon the fourth and fifth, 20 upon the sixth and seventh, 22 upon the eighth and the penultimate turn. Intercostal spaces about one and one-half times as wide as the ribs, well impressed, terminating about one-tenth of the width of the space between the sutures, posterior to the basal suture, leaving the part anterior between their termination and the basal suture as a plain band. Sutures strongly constricted. Periphery of the last whorl well rounded. Base short, well rounded. Entire surface of spire and base marked by numerous microscopic, closely crowded, wavy, spiral striations. Aperture subquadrate, very broad at base, posterior angle obtuse; outer lip thin, bent very strongly at its basal angle; columella slender, slightly oblique, almost straight, weakly revolute.

The type (Cat. no. 206856, U.S.N.M.) has ten post-nuclear whorls, and measures: Length 6.3 mm., diameter 1.9 mm. It was dredged by the U. S. Bureau of Fisheries at station 4322, off La Jolla, California, in 110 to 197 fathoms. Another specimen was dredged by the University of California off Catalina Island.

TURBONILLA (STRIOTURBONILLA) GALIANOI, new species.

Plate 4, figs. 12, 12*a*.

Shell elongate-conic, milk-white, shining. Nuclear whorls very small, two and one-half, forming a rather elevated spire, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls well rounded, very strongly tabulately shouldered at the summit, ornamented with well-developed, rounded, slightly protractively curved axial ribs. Of these ribs, 16 occur upon the first, second, and third, 18 upon the fourth and fifth, 20 upon the sixth, 22 upon the seventh, 24 upon the eighth, 26 upon the ninth, and 28 upon the penultimate turn. These ribs extend equally strong from the summit to the periphery of the whorls. Intercostal spaces not quite as wide as the ribs, well impressed, extending anteriorly to the suture. Sutures strongly constricted. Periphery of the last whorl well rounded. Base rather long, well rounded. Entire surface of spire and base marked by exceedingly fine spiral striations. Aperture subquadrate, posterior angle obtuse; outer lip thin, showing the external sculpture within; columella almost straight, slightly revolute.

The specimen described and another individual (Cat. no. 4104, U.S.N.M.) were collected by J. Xantus at Cape St. Lucas, Lower California. It lacks the nucleus; the ten remaining whorls measure: Length 6.1 mm., diameter 1.8 mm.

Three additional specimens (Cat. no. 162437, U.S.N.M.) come from Pacific Beach, San Diego, California. Cat. no. 162438, U.S.N.M., three specimens from San Hipolite Point, Lower California. Cat. no. 162441, U.S.N.M., another specimen from the same locality. Cat. no. 162439, U.S.N.M., two specimens from Point Abreojos, Lower California. The Delos Arnold collection contains two individuals from San Hipolite Point, Lower California.

Named for Galiano, the Spanish explorer of California.

TURBONILLA (STRIOTURBONILLA) HUMEROSA, new species.

Plate 3, figs. 10, 10*a*.

Shell elongate-conic, milk-white. Nuclear whorls very small, two and one-half, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls very strongly rounded, moderately shouldered at the summit, marked by many strong lamellar, protractive axial ribs, which slope suddenly from a point about one-third of the distance between the sutures, anterior to the summit, giving the whorls a shouldered appearance at this place. Of these ribs, 14 occur upon the second to fourth, 16 upon the fifth to ninth, 18 upon the tenth, and 20 upon the penultimate turn. Intercostal spaces deeply impressed, double the width of the ribs. Sutures strongly marked. Periphery of the last whorl well rounded. Base short, well rounded. Entire surface of spire and base marked by many fine, wavy, spiral striations. Aperture subquadrate, posterior angle obtuse. Outer lip rather thick and somewhat revolute.

The type (Cat. no. 206857, U.S.N.M.) was collected off Catalina Island, California. It has twelve post-nuclear whorls and measures: Length 6 mm., diameter 1.7 mm. Two additional specimens (Cat. no. 205937) were collected at San Diego, California.

TURBONILLA (STRIOTURBONILLA) C-B-ADAMSI Carpenter.

Plate 3, fig. 3.

Chemnitzia C-B-Adamsi CARPENTER, Cat. Maz. Shells, 1856, p. 427.

Shell elongate-conic, milk-white. Nuclear whorls two and one-half, forming a moderately elevated helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls slightly rounded, slightly contracted at the suture, somewhat shouldered at the summit, marked by well-developed, rounded, somewhat protractive axial ribs, of which 12 occur upon the first and second, 14 upon the third to sixth, 16 upon the seventh, and 18 upon the penultimate whorl. Intercostal spaces a little wider than the ribs, terminating at the periphery, marked by very distinct, equally spaced, equal spiral striations. Sutures well marked, rendered wavy by the ribs. Periphery and base of the last whorl well rounded. Aperture rhomboidal; outer lip thin; columella moderately curved.

The type and twelve specimens were collected off *Chama* and *Spondylus* at Mazatlan, Mexico. The type is on tablet 1990, Liverpool collection, British Museum. It has nine post-nuclear whorls, and measures: Length 3.75 mm., diameter 0.9 mm.

TURBONILLA (STRIOTURBONILLA) SERRÆ Dall and Bartsch.

Plate 4, figs. 3, 3*a*.

Turbonilla (*Strioturbonilla*) *serræ* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pl. 44, figs. 8, 8a.

Shell slender, very elongate-conic, subdiaphanous to milk-white. Nuclear whorls two and one-half, depressed, helicoid, having their axis at right angles to that of its succeeding turns, in the first of which they are about one-fifth immersed. Post-nuclear whorls very high between the sutures, moderately rounded, slightly contracted at the periphery and somewhat shouldered at the summit, rendering the sutures subchannelled. The whorls are marked by subequal and subequally spaced, rather broad, rounded, almost vertical axial ribs, which are a little wider than the intercostal spaces, the depressed portion of the latter terminating a little above the suture. In the type, which has lost the nucleus and probably the first two post-nuclear turns, there are 16 ribs on the third of the remaining whorls, 20 on the eighth, 22 upon the eleventh, and 34 upon the next, the penultimate turn. On this whorl the axial ribs are less regular and less strongly developed, showing senile degeneration. Periphery of the last whorl well rounded. Base short, well rounded, marked by slender continuations of the axial ribs, which extend feebly to the insertion of the columella. Entire surface of spire and base crossed by numerous closely placed spiral striations. Aperture subquadrate, posterior angle obtuse, outer lip thin, columella rather strong, somewhat oblique, and slightly revolute, without apparent fold in the aperture. The type has thirteen whorls and measures: Length 7.7 mm., diameter 1.4 mm.

The type and seven specimens were collected by Mr. S. S. Berry in 12 fathoms off Del Monte, Monterey, California; five of these are in Mr. Berry's collection. The type and one other, form Cat. no. 196198. Cat. no. 196200, U.S.N.M., contains a specimen from 40 fathoms off Pacific Grove, Monterey, California, dredged by Mr. Berry. Another specimen in Mr. Berry's collection was dredged in shelly sand at Monterey, California, at a depth of 29 fathoms.

This species is nearest related to *Strioturbonilla stylina* Carpenter, but can readily be distinguished from it by its less rounded whorls, straighter and much stronger ribs, and by having the ribs continuing over the base, and scarcely any space showing between the termination of the intercostal spaces and the suture.

It is named in honor of Father Junipero Serra, the early Spanish missionary to California.

TURBONILLA (STRIOTURBONILLA) ARESTA, new species.

Plate 4, figs. 5, 5*a*.

Shell very slender, milk-white. Nuclear whorls small, two and one-half, forming a moderately elevated, helicoid spire, which has its axis at right angles to that of the succeeding whorls, and is not at all immersed. Post-nuclear whorls moderately rounded, marked by sublamellar, protractive axial ribs, which extend undiminished to the summit of the whorls, rendering this crenulated. There are 14 of these upon the first three whorls, 16 upon the fourth to eighth, 18 upon the ninth, 20 upon the tenth and eleventh, and 21 upon the penultimate turn. Intercostal spaces about one and one-half times as wide on all but the last three whorls; on the latter they are about as wide as the ribs and terminate a little posterior to the suture. Sutures strongly marked. Periphery of the last whorl faintly angulated. Base short, well rounded. Aperture moderately large, subquadrate, posterior angle obtuse. Outer lip thin, bent almost at right angles to the anterior lateral angle. Columella slender, slightly curved and slightly revolute.

The type (Cat. no. 206858, U.S.N.M.) has thirteen post-nuclear whorls and measures: Length 6.4 mm., diameter 1.2 mm. It was dredged off Catalina Island, together with nine additional specimens, by the University of California. Five additional specimens were dredged by the same institution off San Diego. Another specimen (Cat. no. 163252, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2901, off Santa Rosa Island, in 48 fathoms. Another specimen (Cat. no. 206863, U.S.N.M.) comes from San Diego.

TURBONILLA (STRIOTURBONILLA) PAZANA, new species.

Plate 4, figs. 13, 13*a*.

Shell very slender, elongate-conic, milk-white. Nuclear whorls two and three-fourths, forming a decidedly elevated spire, the axis of which is at a right angle to that of the succeeding turns, in the first of which it is scarcely at all immersed. Post-nuclear whorls moderately rounded, with very feebly shouldered summits, ornamented with well-developed narrow protractive axial ribs, 14 occur upon the first to tenth, and 16 upon the remaining turns. Intercostal spaces about two and one-half times as wide as the ribs, well impressed, marked by exceedingly fine, closely spaced, spiral striations. Sutures well impressed, rendered somewhat sinuous by the ribs. Periphery of the last whorl somewhat angulated. Base short, well rounded, marked by fine spiral striations. Aperture rather long, rhomboidal; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella moderately strong, curved, and slightly revolute.

The type (Cat. no. 162430, U.S.N.M.) and 35 specimens were dredged at U. S. Bureau of Fisheries station 2823, in 26½ fathoms, off La Paz, Lower California. The type has fourteen post-nuclear whorls and measures: Length 5.7 mm., diameter 0.8 mm. Cat. no. 163250, U.S.N.M., two from U. S. Bureau of Fisheries station 2822, 21 fathoms, off La Paz, Lower California; Cat. no. 162431, U.S.N.M., seven from U. S. Bureau of Fisheries stations 2826 and 2828, 9½ to 10 fathoms, off Cerros Island. Cat. no. 191565, U.S.N.M., three specimens from U. S. Bureau of Fisheries stations 2826 and 2828, off Ceralvo Island, Gulf of California, same depth and locality as the preceding.

TURBONILLA (STRIOTURBONILLA) GALAPAGENSIS, new species.

Plate 4, fig. 7.

Shell yellowish-white. (Early whorls decollated.) Post-nuclear whorls contracted a little posterior to the middle between the sutures, which gives them a concave outline, slightly shouldered at the summit and somewhat contracted at the sutures; marked by about 22 low, rounded, almost vertical, axial ribs. Intercostal spaces almost as wide as the ribs, marked by fine lines of growth, which gives them a somewhat crinkly appearance, and two incised spiral lines at the contracted part. Periphery and base of the last whorl well rounded, marked by the continuations of the axial ribs. Aperture somewhat fractured, pear-shaped?

The type (Cat. no. 206859, U.S.N.M.) was obtained at U. S. Bureau of Fisheries station 2808, in 634 fathoms, temperature 39.9°, off the Galapagos Islands. It consists of the last four and one-half whorls and measures: Length 3.5 mm., diameter 1.6 mm.

TURBONILLA (STRIOTURBONILLA) UNDATA Carpenter.

Plate 4, fig. 8.

Chemnitzia undata Carpenter, Cat. Mazatlan Shells, 1856, pp. 431, 432.

"Shell graceful, slender, soiled white. Nuclear whorls extending somewhat beyond the outline of the post-nuclear spire. Post-nuclear whorls subplanate, separated by strong sutures and marked by about eighteen narrow, acute axial ribs which are very weak at the periphery and disappear entirely on the base. Intercostal spaces broad, marked by superficial spiral striations which are strongest at the periphery. Outer lip thin; columella graceful, scarcely twisted."

The above is Carpenter's description, to which he adds: "On comparing this shell with the corresponding portion of *C. gracilior* C. B. Ads., it is found to have fewer and much finer and sharper ribs which do not end at the periphery, like the curved interspaces; length 1.6 mm., diameter 0.55 mm. Hab. Mazatlan; two young perfect specimens off *Spondylus;* Liverpool collection, tablet 2002 contains the larger specimen; the smallest is of a much darker color."

The specimen referred to above, tablet 2002, is a badly worn young shell, with indications of very protractive axial ribs and finely spirally striated base.

Carpenter's manuscript figure is evidently taken from the young individual referred to above, which shows a peripheral series of pits and numerous fine spiral striations.

TURBONILLA (STRIOTURBONILLA) AFFINIS C. B. Adams.

Plate 4, fig. 14.

Chemnitzia affinis C. B. Adams, Ann. Lyc. Nat. Hist., of N. Y., vol. 5, 1852, p. 389.

Shell slender, wax yellow, with a narrow brighter colored band about one-third of the distance between the sutures, anterior to the summit. (Nuclear whorls decollated.) Post-nuclear whorls slightly rounded and moderately shouldered at the summit, marked by well-rounded, low, slightly protractive axial ribs, of which 18 occur upon the first and second, 20 upon the third and fourth, 22 upon the fifth, 24 upon the sixth and the remaining turns. Intercostal spaces a little narrower than the ribs, shallow, marked by a moderately strong series of peripheral pits and probably 60 to 80 fine, equal, and equally spaced, strongly incised spiral lines. Periphery and base well rounded, marked by numerous, closely spaced, well incised, wavy spiral striations. Aperture rhomboid, outer lip thin, showing the external sculpture within; columella moderately strong, almost straight and somewhat revolute.

Professor Adams's type, which has served for our description and figure, consists of the last eight whorls and measures: Length 5.3 mm., diameter 1.3 mm. It is in the Amherst College collection and comes from Panama.

TURBONILLA (STRIOTURBONILLA) PHANEA, new species.

Plate 4, figs. 4, 4*a*.

Shell very small and slender, milk-white. Nuclear whorls two, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls well rounded, with their greatest convexity on the anterior third between the sutures. Summits appressed, marked by strong, narrow, slightly protractive axial ribs, of which fourteen occur upon all of the whorls. Intercostal spaces about three times as wide as the ribs, marked between the sutures by a peripheral series of pits and sixteen equal and equally spaced incised fine lines. Sutures well impressed. Periphery of the last whorl well rounded, appearing as a plain band. Base short, well rounded, marked by the faint continuations of the axial ribs and about fifteen very fine, wavy incised, spiral lines, of which the first below the periphery is a little stronger than the rest. Aperture rhomboid, rather long; posterior angle acute; outer lip thin, showing the external sculpture within; columella rather long, almost straight, slightly revolute; parietal wall marked by a faint callus.

The type and two additional specimens (Cat. no. 206860, U.S.N.M.) were obtained at U. S. Bureau of Fisheries station 2823, in 26½ fathoms, on broken-shell bottom, off La Paz, in the Gulf of California. The type has 8 post-nuclear whorls and measures: Length 3.2 mm., diameter 0.8 mm. Cat. no. 163251, U.S.N.M., contains a specimen dredged at U. S. Bureau of Fisheries station 2822, in 21 fathoms, off La Paz, Lower California. Cat. no. 206861, U.S.N.M., has five specimens dredged at U. S. Bureau of Fisheries stations 2826 to 2828, in 9½ to 10 fathoms, off Ceralvo Island, Lower California.

TURBONILLA (STRIOTURBONILLA) IMPERIALIS, new species.

Plate 4, figs. 2, 2*a*.

Shell elongate-conic, milk-white, with a narrow, faint yellow band in the middle of the whorls between the sutures. Nuclear whorls at least two, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-half immersed. Post-nuclear whorls well rounded, depressed at the summit, somewhat contracted at the sutures, marked by slender, almost vertical axial ribs, of which 20 occur upon the first and second, 22 upon the third, 24 upon the fourth, 26 upon the sixth and penultimate turn. Intercostal spaces are twice as wide as the ribs, marked by a series of moderately strong pits at the periphery, and about twenty-six well incised, equal and subequally spaced spiral striations, which pass up on the side of the ribs but do not cross their summits. Periphery of the last whorl angulated. Base short, well rounded, marked by the very feeble continuations of the axial ribs and about twelve equally strong, slender, wavy, spiral striations. Aperture defective, rhomboidal?

The type (Cat. no. 206862, U.S.N.M.) comes from Panama. It has 8 post-nuclear whorls and measures: Length 3.3 mm., diameter 1.1 mm.

TURBONILLA (STRIOTURBONILLA) SMITHSONI, new species.

Plate 4, figs. 10, 10*a*.

Shell very regularly conic, wax yellow, the area from a little above the suture to the middle of the whorls between the sutures a little higher than the rest. Nuclear whorls small, at least two-thirds obliquely immersed in the first post-nuclear turn, beyond the outline of which it extends some on the left side. Post-nuclear whorls decidedly flattened, very slightly shouldered at the summit, scarcely at all contracted at the periphery, marked by rounded, low, poorly developed, axial ribs, of which 18 occur upon the first and second, 22 upon the third, 24 upon the fourth, 28 upon the fifth, 32 upon the sixth and the penultimate turn. Intercostal spaces a little narrower than the ribs, shallow, marked by series of well-impressed pits at the periphery and a second one a little less strong a little anterior to the middle of the space between the sutures; the space between the peripheral and the other series of pits is crossed by about twenty-five equal and equally spaced spiral striations; that between the middle pits and the suture by about forty of equal strength. Sutures poorly defined. Periphery and base of the last whorl well rounded, marked by numerous fine, wavy, spiral striations. Aperture? (outer lip fractured); columella strong, with an oblique fold a little below the insertion.

The type (Cat. no. 160068, U.S.N.M.) comes from Cape St. Lucas. It has 8 post-nuclear whorls and measures: Length 4 mm., diameter 1.3 mm. Cat. no. 46502, U.S.N.M., contains a specimen from Boca de los Piedras.

Named for James Smithson.

TURBONILLA (STRIOTURBONILLA) GRACILIOR C. B. Adams.

Plate 4, fig. 6.

Chemnitzia gracilior C. B. ADAMS, Ann. Lyc. of Nat. Hist. N. Y., vol. 5, 1852, p. 391.

Shell elongate-conic, milk-white. (Nuclear whorls decollated.) Post-nuclear whorls well rounded, moderately shouldered at the summit; later ones slightly exserted at the summit; marked by slender, sinuous, slightly protractive axial ribs, of which 16 occur upon the first and second, 18 upon the third, 20 upon the fourth to seventh, 22 upon the eighth, 26 upon the ninth, and 32 upon the penultimate turn. Intercostal spaces about twice as wide as the ribs, marked by a double series of pits, the first of which is at the periphery, the second a little posterior to the middle between the sutures. In addition to these pits, they are marked by fine, equal and equally spaced spiral striations of which thirty-one probably occur between the peripheral and median pit and twenty between that and the summit. Sutures well marked. Periphery and base of the last whorl well rounded, marked by the continuations of the axial ribs and numerous fine, well-incised, wavy spiral striations. Aperture rather long, rhomboidal; outer lip fractured; columella moderately strong, slightly curved and somewhat reflected, provided with a weak oblique fold at its insertion.

Professor Adams's type has served for our description and figure. It has lost the nucleus. The eleven remaining whorls measure: Length 6.1 mm., diameter 1.4 mm. It is in the Amherst College collection and comes from Panama.

Subgenus **PTYCHEULIMELLA** Sacco.

Ptycheulimella SACCO, I. Moll. de Piemonte e della Liguria, pt. 11, 1892, p. 59.

Shell elongate-conic. Axial sculpture consisting of obsolete ribs frequently only shown in the early post-nuclear turns. Spiral sculpture, if present, consisting of microscopic striations only.

Type.—Tornatella pyramidata Deshayes.

KEY TO THE SPECIES OF THE SUBGENUS PTYCHEULIMELLA.

Shell very broadly conic	*obsoleta.*
Shell slender	*abreojensis.*

TURBONILLA (PTYCHEULIMELLA) OBSOLETA Carpenter.

Plate 5, fig. 6.

? *Eulimella obsoleta* CARPENTER, Cat. Mazatlan Shells, 1856, p. 436.

Shell broadly elongate, grayish white. Post-nuclear whorls feebly rounded, marked by obsolete axial ribs which are best shown immediately below the appressed summit. Entire surface marked by extremely fine spiral lines. Aperture rhomboidal; posterior angle acute; outer lip thin; columella slightly twisted and somewhat revolute.

The type which is on tablet 2011, Liverpool collection, British Museum, has lost its early whorls, the four and one-half remaining measure: Length 1.5 mm., diameter 0.6 mm. It comes from Mazatlan, Mexico.

TURBONILLA (PTYCHEULIMELLA) ABREOJENSIS, new species.

Plate 5, fig. 7.

Shell conic, milk-white. (Nuclear whorls decollated.) Post-nuclear whorls moderately well rounded, very slightly shouldered at the summit, marked by mere indications of obsolete ribs near the summit of the early whorls, only. Sutures well impressed. Periphery well rounded. Base moderately long, well rounded. Surface of spire and base marked by fine, closely crowded, spiral striations. Aperture oval; posterior angle acute; columella rather strong, moderately curved, somewhat revolute, provided with an oblique fold a little anterior to the insertion.

The unique type (Cat. no. 205951, U.S.N.M.) comes from Point Abreojos, Lower California. It has lost the nucleus and first post-nuclear whorl. The nine remaining measure: Length 5.2 mm., diameter 1.6 mm.

Subgenus **PYRGOLAMPROS** Sacco.

Pyrgolampros SACCO, I. Moll. del Piemonte e della Liguria, 1892, p. 85.

Turbonillas with low, broad, rounded vertical ribs which almost always disappear as they pass over the periphery and base of the last whorl, and many very fine, faint, wavy spiral striations; surface covered by a thin epidermis. Columella usually somewhat flexuose.

Type.—*Pyrgolampros mioperplicatulus* Sacco.

All our west American species are of a light-yellow to chocolate-brown color. The intercostal spaces are not depressed as in *Chemnitzia*, but appear as simple shallow undulations between the axial ribs. The spiral striations, in perfect specimens, appear as if they were situated beneath a light-colored epidermis and were shining through it.

KEY TO THE SPECIES OF THE SUBGENUS PYRGOLAMPROS.

- Axial ribs well developed.
  - Shell short and stout.
    - Shell unicolor.
      - Whorls excurved at the summit.......................... *victoriana*, p. 61.
      - Whorls not excurved at the summit.
        - Shell brown.
          - Axial ribs 12–16.............................. *gibbosa*, p. 61.
          - Axial ribs 18–20.............................. *ridgwayi*, p. 62.
        - Shell light fulvous.............................. *valdezi*, p. 62.
    - Shell banded.. *newcombei*, p. 63.
  - Shell elongate-conic.
    - Shell unicolor.
      - Shell large, adult more than 10 mm. long................ *taylori*, p. 64.
      - Shell smaller, adult less than 8 mm. long.
        - Whorls well rounded................................ *lowei*, p. 64.
        - Whorls flattened.
          - Axial ribs strong, acute...................... *halibrecta*, p. 65.
          - Axial ribs weak, rounded...................... *gouldi*, p. 66.
    - Shell bicolor.
      - Spire golden yellow, base white...................... *aurantia*, p. 66.
      - Posterior two-thirds between the sutures light brown, anterior third and base darker........................ *pedroana*, p. 67.
    - Shell banded.
      - Band single, broad, extending over the periphery and to both sides of it.
        - Shell large, adult more than 8 mm. long.............. *halia*, p. 68.
        - Shell small, adult less than 6 mm. long.............. *lyalli*, p. 68.
      - Bands double.
        - Bands lighter than rest of shell...................... *berryi*, p. 69.
        - Bands darker than rest of shell...................... *alaskana*, p. 70.
      - Bands triple.
        - Bands not visible on the spire only in the outer lip.. *chocolata*, p. 70.
      - Bands visible on the spire.
        - Axial ribs on penultimate whorl 22.................. *painei*, p. 71.
        - Axial ribs on penultimate whorl 30.................. *keepi*, p. 71.
- Axial ribs poorly developed on the early whorls, never indicated on the later ones.
  - Shell dark brown with a narrow lighter band.................. *halistrepta*, p. 72.
  - Shell wax yellow with a light brown peripheral zone.
    - Shell large, adult more than 11 mm. long.................... *lituyana*, p. 73.
    - Shell smaller, adult less than 9 mm. long.................. *oregonensis*, p. 73.

TURBONILLA (PYRGOLAMPROS) VICTORIANA Dall and Bartsch.

Plate 5, fig. 3.

Turbonilla (*Pyrgolampros*) *victoriana* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 501, pl. 44, fig. 6.

Shell elongate-conic, wax yellow to light brown. Nuclear whorls and the early succeeding turns eroded in all the specimens examined. Post-nuclear whorls quite high between the sutures, somewhat concave in the posterior two-thirds of the exposed portion, only slightly contracted toward the periphery and faintly shouldered at the summit; ornamented by low, rounded, somewhat sinuous axial ribs, which are about as wide as the shallow intercostal spaces. Sutures well marked. Periphery and base of the last whorl somewhat inflated, marked by weak continuations of the axial ribs which extend feebly to the umbilical region. Entire surface crossed by numerous, wavy spiral striations. Aperture rather elongate, oval, outer lip thin; columella moderately long, decidedly twisted and somewhat revolute in its free anterior portion; the twist at its insertion appearing as a fold.

The type (Cat. no. 126660*a*, U.S.N.M.) was collected by Dr. C. F. Newcombe at Victoria, Vancouver Island, British Columbia. It has the last seven and a half whorls and measures: Length 7 mm., diameter 2.1 mm. Ten additional speciments were collected by Rev. G. W. Taylor, at Departure Bay, Vancouver Island, British Columbia, four of which form Cat. no. 196220, U.S.N.M.

This species appears nearest related to *Turbonilla* (*Pyrgolampros*) *newcombei* Dall and Bartsch, but is readily distinguished from that form by its concave whorls.

TURBONILLA (PYRGOLAMPROS) GIBBOSA Carpenter.

Plate 6, fig. 2.

Chemnitzia gibbosa Carpenter, Cat. Mazatlan Shells, 1856, p. 430.

Shell pupiform, reddish brown, irregular. (Nuclear whorls decollated.) Post-nuclear whorls ten, flattened, marked with about eighteen poorly developed, more or less rounded, vertical axial ribs. This species is described, although from a solitary and very imperfect specimen, in consequence of its great peculiarity of form, in which it resembles *Chrysallida*. It is short, stumpy, and very broad; without any trace of fold on the columella or notch on the base. Length 6.75 mm., diameter 5 mm.

Habitat.—Mazatlan; off *Chama*, extremely rare; Liverpool collection.

Tablet 1996 contains all that was found, namely, the broken specimen, and a fresh fragment displaying sculpture.

The above is Doctor Carpenter's original description. An examination of the two specimens in the British Museum sheds little additional light. The fragment is a thick, stumpy shell too poor to be determined. The small individual is of a light-brown color, showing irregular axial ribs and smooth intercostal spaces.

TURBONILLA (PYRGOLAMPROS) RIDGWAYI, new species.

Plate 6, figs. 10, 10*a*.

Shell robust, brown. Nuclear whorls two and one-half, moderately large, forming a depressed helicoid spire, the axis of which is almost at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls flattened in the middle, rounded at the moderately strong shoulder at the summit, and at the periphery; marked by strong, well elevated, rounded, almost vertical axial ribs, which are slightly contracted in the middle and somewhat sinuous. Of these ribs, 18 occur upon the third to sixth and 20 upon the penultimate whorl. Intercostal spaces well impressed, decidedly so in the middle, a little wider than the ribs. Sutures strongly marked, rendered sinuous by the ribs at the summits of the whorls. Periphery of the last whorl well rounded. Base moderately long, well rounded, marked by the feeble continuations of the axial ribs. Entire surface of base and spire marked by closely crowded, wavy, well-incised spiral striations. Aperture moderately large, oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella moderately strong, somewhat curved and revolute, provided with a weak oblique fold at its insertion.

The type (Cat. no. 162560, U.S.N.M.) comes from San Diego, California. It has seven post-nuclear whorls and measures: Length 4.6 mm., diameter 2 mm.

Named for Robert Ridgway of the U. S. National Museum.

TURBONILLA (PYRGOLAMPROS) VALDEZI Dall and Bartsch.

Plate 6, fig.8.

Turbonilla (*Pyrgolampros*) *gibbosa* Dall and Bartsch, Mem. Cal. Acad. Sci., vol. 3, 1903, pp. 27–9, pl. 1, figs. 2, 2*a*, not *Chemnitzia gibbosa* Carpenter, Cat. Maz. Shells, 1856, p. 430, No. 525.—*Turbonilla* (*Pyrgolampros*) *valdezi* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 502, pl. 44, figs. 3, 3*a*.

Shell inflated, robust, broad and stumpy, of light fulvous coloration. Nuclear whorls decollated in the type. Post-nuclear whorls flattened, somewhat contracted at the periphery and rounded at the summit, traversed by broad, coarse, irregularly slanting axial ribs, which extend over the inflated periphery of the last whorl to the umbilical region, appearing less prominent on the base. About 16 of these ribs occur upon the second, 18 upon the fifth, and 24 upon the penultimate post-nuclear whorl. Entire surface of the shell crossed by very minute, close spiral striation. Suture subchanneled and wavy. Aperture ovate, outer lip thin, joining the twisted and revolute columella in a broad curve.

The type (Cat. no. 32273, U.S.N.M.) was collected at Monterey, California. It has seven post-nuclear whorls and measures: Length 5.6 mm., diameter 2.1 mm.

Another specimen, not quite adult (Cat. no. 176624, U.S.N.M.), comes from Pacific Grove, California. This has the nuclear whorls preserved, which are two, depressed helicoid, smooth, obliquely about one-fourth immersed in the first of the succeeding turns, having their axis at right angles to that of the later whorls. The left side of its nucleus projects slightly beyond the outline of the spire.

The present form is in every way much more robust than *T.* (*P.*) *gibbosa* Carpenter, which was described from Mazatlan, Mexico.

TURBONILLA (PYRGOLAMPROS) NEWCOMBEI Dall and Bartsch.

Plate 6, fig. 3.

Turbonilla (*Pyrgolampros*) *newcombei* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 503, pl. 45, fig. 6.

Shell regularly, broadly conic, white on the posterior half and light brown on the anterior half of the exposed portion of the whorl; base white. Nuclear whorls decollated in all the specimens seen. Post-nuclear whorls somewhat overhanging, decidedly contracted toward the periphery from the anterior fifth of the exposed part; almost flattened posterior to this, and closely appressed at the summit, separated by strongly marked sutures. Ribs about 18 upon all the turns, almost vertical, moderately elevated, rounded in the middle, decidedly flattened and widened at the summit, disappearing at the periphery. Intercostal spaces not depressed below the general surface, a little wider than the ribs. Periphery and the moderately long base well rounded, smooth, excepting the fine spiral striation which covers the entire surface of the shell. Aperture subquadrate, posterior angle acute; outer lip thin, showing the color bands within; columella slender, oblique, and slightly revolute.

The type (Cat. no. 126660, U.S.N.M.) was collected by Dr. C. F. Newcombe, at Victoria, Vancouver Island, British Columbia. It has seven post-nuclear whorls which measure: Length 5.4 mm., diameter 2.1 mm. Eighteen additional specimens were collected by Rev. G. W. Taylor at Port Simpson, British Columbia, 12 of which are in his collection, the other 6 form Cat. no. 196214, U.S.N.M.

TURBONILLA (PYRGOLAMPROS) TAYLORI Dall and Bartsch.

Plate 6, figs. 7, 7*a*.

Turbonilla (*Pyrgolampros*) *taylori* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 499, pl. 44, figs. 9, 9*a*.

Shell very regularly elongate-conic, purplish-brown. Entire surface marked by numerous closely placed minute spiral striations. Nuclear whorls small, depressed helicoid, smooth, scarcely at all immersed, having their axis at a right angle to that of the later turns, the sides not projecting beyond the outline of the spire. Post-nuclear whorls quite high between the sutures, only slightly contracted toward the periphery and very weakly beveled at the appressed summits, marked by low, broad, retractive axial ribs, which are much more numerous and less strongly defined on the early whorls than on those succeeding. There are about 36 on the second, 30 upon the third, 24 upon the fourth, and 26 upon the antepenultimate post-nuclear turn. On the last whorl they become irregular and irregularly spaced, showing senility. The ribs become flattened and less strongly defined toward the summit and the periphery, disappearing at the well-rounded periphery. Sutures well marked. Base short, inflated, rounded. Aperture suboval, somewhat effuse anteriorly; posterior angle acute; outer lip thin, white edged, chestnut brown within except at the very base, which is white; columella slender, twisted, and slightly revolute anteriorly.

The above description is based upon two cotypes (Cat. no. 196210, U.S.N.M.); one, an immature specimen having the nucleus and 9 post-nuclear whorls measures: Length 6.5 mm., diameter 1.9 mm., the other an adult individual having 10 whorls is minus the nucleus and probably the first five post-nuclear turns, and measures: Length 11.5 mm., diameter 3.1 mm.

The two cotypes and 30 specimens were collected by the Rev. G. W. Taylor at Departure Bay, British Columbia. The cotypes and five specimens are in the U. S. National Museum (Cat. no. 196210). The rest are in the Taylor collection.

This species was collected at five additional stations in British Columbia by the Rev. G. W. Taylor, all the specimens being in his collection except where otherwise stated. One specimen at Carter Bay; 3 at Port Simpson, 1 of which is Cat. no. 196211, U.S.N.M.; 11 at Banks Island, 3 of which are Cat. no 196212, U.S.N.M.; 6 at Alert Bay, 2 of which are Cat. no. 196213, U.S.N.M.

TURBONILLA (PYRGOLAMPROS) LOWEI Dall and Bartsch.

Plate 6, figs. 11, 11*a*.

Turbonilla (*Pyrgolampros*) *lowei* Dall and Bartsch, Mem. Cal. Acad., vol. 3, 1903, p. 278, pl. 1, figs. 5, 5*a*.

Shell elongate-conic, uniformly light brown. Nuclear whorls two, small, depressed, helicoid, having their axis almost at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Early post-nuclear whorls increasing but little in diameter, rather high between the sutures, ornamented by very slender, somewhat sinuous, almost vertical axial ribs. Later whorls increasing more rapidly in diameter, less elevated between the sutures, ornamented by low, broad, rounded, almost vertical axial ribs, which become decidedly enfeebled as they approach the summit. There are almost 40 axial ribs upon the first, 34 upon the second, 30 upon the third, 25 upon the fourth, 20 upon the fifth to eleventh, and 22 upon the penultimate whorl. Intercostal spaces mere lines, on the first whorl, on the later ones shallow impressed areas of about half the width of the ribs. Sutures well marked. Periphery of the last whorl inflated. Base short, well rounded, posterior portion marked by the very feeble extensions of the axial ribs; the anterior smooth, excepting the very fine and exceedingly closely spaced spiral striations, which cover the entire surface of the shell. Aperture subquadrate; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, slightly twisted.

The type and four additional specimens (Cat. no. 152751*a*, U.S.N.M.), were collected by Mr. H. N. Lowe, in 10 fathoms off San Pedro, California. The type has lost the nucleus. The ten remaining whorls measure: Length 7.2 mm., diameter 2.2 mm. Cat. no. 204941, U.S.N.M., was dredged by Mrs. Oldroyd, in 4 fathoms off San Pedro. Cat. no. 159982, U.S.N.M., one specimen from San Pedro. Cat. no. 163257, U.S.N.M., San Pedro, collected by Mrs. Oldroyd. Cat. no. 205948, U.S.N.M., one specimen from Pacific Beach, collected by Mr. Henry Hemphill. One (Cat. no. 206864) dredged at U. S. Bureau of Fisheries, station 4345, in 25 fathoms, gray sand bottom, off Point Loma, California.

TURBONILLA (PYRGOLAMPROS) HALIBRECTA, new species.

Plate 5, figs. 10, 10*a*.

Shell elongate-conic. Nuclear whorls two, depressed, helicoid, having their axis at nearly right angles to that of the succeeding turns, in the first of which they are very slightly immersed. Post-nuclear whorls flattened in the middle, slightly rounded toward the somewhat shouldered summit and the periphery, marked by strong, rounded, almost vertical axial ribs, of which there are 20 on the first to fifth, 18 upon the sixth, and 16 upon the remaining turns. Intercostal spaces a little wider than the ribs, well impressed, sutures strongly marked. Periphery of the last whorl well rounded, marked by the feeble continuations of the axial ribs. Base short, well rounded. Entire surface of spire and base marked by exceedingly fine, closely crowded, spiral striations. Aperture rather small, oval; posterior angle acute; columella short and curved.

The type (Cat. no. 205950 U.S.N.M.) was collected off Catalina Island. It has 9 post-nuclear whorls and measures: Length 6.2 mm., diameter 1.7 mm.

TURBONILLA (PYRGOLAMPROS) GOULDI, new species.

Plate 6, figs. 1, 1*a*.

Shell slender, light brown. Nuclear whorls small, two, depressed, helicoid, having their axis almost at right angles to that of the succeeding turns, in the first of which they are slightly immersed. Post-nuclear whorls increasing regularly in size, marked by low, rounded, feebly developed axial ribs, of which there are 24 upon the second to fourth, 20 upon the fifth to eighth, 22 upon the ninth and penultimate turn. Intercostal spaces narrow and shallow. Sutures moderately impressed. Periphery of the last whorl well rounded, somewhat inflated. Base short, inflated. Entire surface of spire and base covered by numerous fine, closely spaced, wavy spiral striations. Aperture oval; posterior angle acute; outer lip thick within, thin at edge; columella moderately long, sinuous, and slightly reflected.

The above description is based on two cotypes, one (Cat. no. 163256*a* U.S.N.M.) from San Pedro, California, has furnished the description of the nucleus and early whorls, the other (Cat. no. 159990, U.S.N.M.) also from San Pedro, consisting of the last seven whorls, has furnished the adult characters. The young specimen has 9 post-nuclear whorls and measures: Length, 5.8 mm., diameter 2 mm. The adult specimen measures: Length 6.1 mm., diameter 2 mm.

Cat. no. 162561, U.S.N.M., contains a fragment collected by Henry Hemphill at Pacific Beach. Cat. no. 163256, U.S.N.M., nine specimens from San Pedro, collected by Mrs. Oldroyd. Cat. no. 163258, U.S.N.M., one specimen, dredged by the U. S. Bureau of Fisheries at station 2900, in 13 fathoms, off Santa Rosa Island. Another specimen was dredged by the University of California at station 59, off San Diego, California. Twelve specimens were identified for Mrs. Oldroyd from San Pedro.

Named for the late Doctor A. A. Gould.

TURBONILLA (PYRGOLAMPROS) AURANTIA Carpenter.

Plate 6, fig. 4.

Chemnitzia (? var.) *aurantia* Carpenter, Journ. de Conch., vol. 12, 1865 (3d ser.), vol. 5, p. 147. *Turbonilla* (*Pyrgolampros*) *aurantia* (Carpenter) Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 502, 503, pl. 45, fig. 5.

Shell similar to *T.* (*P.*) *chocolata* Carpenter, but much broader, with the close spiral striation a little more pronounced than in that species, covered by a golden-yellow epidermis. Nuclear whorls decollated in all our specimens. Post-nuclear whorls moderately rounded, but little contracted at base and but very slightly shouldered at the summit, ornamented by about 22 moderately developed, slightly retractive axial ribs on each of the whorls. These ribs become quite obsolete as they pass over the well-rounded periphery and base of the last whorl. Intercostal spaces weak, much narrower than the ribs. Sutures quite prominent, simple. Aperture large, broadly ovate, posterior angle obtuse, somewhat effuse at base; outer lip thin, columella slender, quite oblique, twisted, and revolute.

Doctor Carpenter's type (Cat. no. 4493*b*, U.S.N.M.), upon which the description is based, has 6 post-nuclear whorls and measures: Length 5.8 mm., diameter 2.4 mm. It bears the two localities Puget Sound and Santa Barbara, and probably comes from Puget Sound.

Three other specimens (Cat. no. 126660, U.S.N.M.) were collected by Dr. C. F. Newcombe at Victoria, Vancouver Island, British Columbia, and five more by the Rev. G. W. Taylor at Departure Bay, British Columbia, one of which is Cat. no. 196205, U.S.N.M., the others being in the Taylor collection. This one has 9 whorls remaining and measures: Length 9.5 mm., diameter 2.8 mm.

TURBONILLA (PYRGOLAMPROS) PEDROANA Dall and Bartsch.

Plate 6, figs. 12, 12*a*.

Turbonilla (*Pyrgolampros*) *lowei pedroana* Dall and Bartsch, Mem. Cal. Acad., vol. 3, 1903, p. 279, pl. 2, figs. 3, 3*a*.

Shell elongate-conic, posterior two-thirds between the sutures light brown, anterior third and base darker, the two areas being separated by a still darker narrow band. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, rounded toward the summit and the suture, ornamented by broad, low, well rounded, slightly protractive axial ribs, which become slightly flattened toward the summit; of which 16 appear upon the first and second, 18 upon the third to fifth, 20 upon the sixth, 22 upon the seventh and the penultimate turn. Intercostal spaces almost as wide as the ribs, shallow. Sutures well impressed. Periphery and the rather short base of the last whorl somewhat inflated and well rounded. Entire surface of spire and base marked by well incised, closely spaced, fine, spiral striations; aperture rather small, oval; posterior angle acute; outer lip thin, showing the external sculpture and coloration within; columella sigmoid, slender and slightly revolute.

The type (Cat. no. 15275, U.S.N.M.) and three additional specimens were dredged in 10 fathoms off San Pedro, California. The type has 10 post-nuclear whorls and measures: Length 7 mm., diameter 2.3 mm. Cat. no. 163255, U.S.N.M., contains three specimens collected at San Pedro by Mrs. Oldroyd. One specimen, Cat. no. 206865, U.S.N.M., dredged at U. S. Bureau of Fisheries station 4309, in 67 to 78 fathoms, on fine sand and broken shell bottom, 9 miles off Point Loma Light, California.

TURBONILLA (PYRGOLAMPROS) HALIA, new species.

Plate 5, fig. 11.

Shell elongate-conic, wax-yellow at the summit, grading to brown at the suture; anterior part of base, wax-yellow. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, rounding gently toward the summit and the suture, marked by low, broad, well rounded, slightly protractive axial ribs, of which 16 occur upon the second, 18 upon the third and fourth, 20 upon the fifth to seventh, 24 upon the eighth, and 28 upon the penultimate turn; upon this they are less regular, somewhat enfeebled and retractive. Intercostal spaces a little narrower than the ribs. Sutures well impressed. Periphery of the last whorl well rounded. Base moderately long, well rounded. Entire surface of spire and base marked by numerous fine, crowded, wavy spiral striations. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture and coloration within; columella slender, slightly curved and revolute; parietal wall covered by a thin callus.

The type (Cat. no. 59328, U.S.N.M.) was collected at San Diego, California. It has 10 post-nuclear whorls and measures: Length 8.5 mm., diameter 2.5 mm.

Cat. no. 205946, U.S.N.M., contains a specimen collected by Mr. H. N. Lowe in 8 fathoms off San Pedro. Cat. no. 205947, U.S.N.M., two additional specimens from the same gentleman, collected in 10 fathoms off San Pedro. One specimen in Mr. S. S. Berry's collection comes from Santa Barbara, California.

TURBONILLA (PYRGOLAMPROS) LYALLI Dall and Bartsch.

Plate 6, figs. 6, 6*a*.

Turbonilla (*Pyrgolampros*) *lyalli* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 500, 501, pl. 44, figs. 4, 4*a*.

Shell small and slender with strong sculpture, whitish with a broad chestnut band which extends almost halfway over the exposed portion of the whorls above the periphery and an equal distance anteriorly over the base below the periphery. Nuclear whorls two, closely appressed to each other, forming a polished depressed helicoid spire, which does not extend beyond the outline of the post-nuclear spire, is not at all immersed and has its axis at right angles to the axis of the succeeding turns. Post-nuclear whorls decidedly flattened, moderately contracted at the periphery, and slightly shouldered at the summit, ornamented by strongly elevated, moderately broad, rounded retractive axial ribs, which become somewhat flattened toward the summit and periphery of the turns. There are about 22 ribs upon the second, 20 upon the fifth and the penultimate turn. Upon the first they are very weakly expressed. Intercostal spaces broad, almost double the width of the ribs. Sutures strongly impressed. Periphery and base of the last whorl well rounded, marked by the continuations of the axial ribs which extend feebly to the umbilical region. Entire surface marked by numerous closely placed spiral striations. Aperture pyriform, posterior angle acute, columella almost straight, obliquely inserted, slightly revolute.

The unique type (Cat. no. 196221, U.S.N.M.) was collected by Rev. G. W. Taylor at Banks Island, British Columbia. It has 9 post-nuclear turns and measures: Length 5.7 mm., diameter 1.4 mm.

TURBONILLA (PYRGOLAMPROS) BERRYI Dall and Bartsch.

Plate 6, figs. 5, 5*a*.

Turbonilla (*Pyrgolampros*) *berryi* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 500, pl. 44, figs. 10, 10*a*.

Shell slender, very regularly acutely conic, bright chestnut-brown, with two narrow spiral bands of a lighter shade; one, the narrower of the two, is at the periphery, the other has its posterior edge at about the middle of the exposed portion between the sutures. Nuclear turns two and one-fourth, smooth, depressed, helicoid, not immersed, having their axis at a right angle to the axis of the later whorls, their sides projecting slightly beyond the outlines of the spire. Post-nuclear whorls very high between the sutures, slightly beveled at the summit and moderately constricted at the periphery, ornamented by well-developed, acute, retractive axial ribs, of which there are about 20 upon the second, 24 upon the fifth, and 26 upon the penultimate turn. These ribs extend quite strongly to the summit, where they feebly crenulate the well-impressed sutures. Periphery and base of the last whorl well rounded, marked by the continuations of the axial ribs, which gradually disappear as they cross the base. Entire surface marked by numerous very fine, closely spaced, wavy, spiral striation. Aperture suboval, somewhat effuse anteriorly; posterior angle acute; columella oblique, very slightly twisted and weakly revolute at its outer extremity.

The type (Cat. no. 196223, U.S.N.M.) has 9 post-nuclear whorls and measures: Length 8 mm., diameter 2.2 mm. It and another specimen in Mr. S. S. Berry's collection were dredged by him in 39 fathoms on sandy bottom in Monterey Bay.

Another specimen (Cat. no. 196225, U.S.N.M.) was dredged by the Bureau of Fisheries steamer *Albatross*, at station 4564, in 9 to 10 fathoms, rocky bottom, with a temperature of 59°, 2 miles off Santa Cruz Light, Monterey Bay, California.

A fourth shell (Cat. no. 196224, U.S.N.M.) was dredged in 52 fathoms, off Catalina Island, California.

TURBONILLA (PYRGOLAMPROS) ALASKANA, new species.

Plate 6, fig. 9.

Shell elongate-conic, wax yellow, with a broad, peripheral, light-brown band and a narrow one immediately below the summit; these are best seen in the aperture. (Nuclear whorls decollated in all our specimens.) Post-nuclear whorls increasing very slowly in diameter in the first three turns, then more rapidly. The summits of succeeding turns fall a little below the periphery, which gives the whorls an overhanging appearance. The whorls are marked by very strong, well elevated, broad, rounded, irregularly slanting axial ribs which become slightly widened and flattened both at the summit and at the periphery. There are about 18 of them upon all but the last turn; upon this there are about 22. Intercostal spaces about as wide as the axial ribs. Sutures strongly impressed. Periphery of the last whorl somewhat angulated, base moderately long, well rounded, marked by feeble extensions of the axial ribs and many fine, closely spaced, wavy spiral striations; the latter also mark the spaces between the sutures. Aperture moderately large, ovate, posterior angle acute; outer lip moderately thick; columella oblique, curved and strongly revolute; parietal wall covered by a strong callus.

The type and seven specimens (Cat. no. 160206, U.S.N.M.) were collected at St. Paul, Kadiak, Alaska, in 13 fathoms, mud bottom, by Dr. W. H. Dall. The type has lost the nucleus and probably the first one and one-half post-nuclear turns. The nine remaining measure: Length 8 mm., diameter 2.6 mm. The following specimens were all collected by Doctor Dall (Cat. no. 205149, U.S.N.M.). Nine specimens from Chagafka Cove, Kadiak, Alaska; (Cat. no. 205150 U.S.N.M.), one specimen from Granite Cove, Port Althorp, Alaska, in 8 fathoms on sand bottom; (Cat. no. 160209, U.S.N.M.) three specimens from Sitka Harbor, Alaska, in 12 fathoms on mud and gravel bottom.

TURBONILLA (PYRGOLAMPROS) CHOCOLATA Carpenter.

Plate 5, figs. 9, 9*a*.

Chemnitzia chocolata Carpenter, Proc. Cal. Acad. Sci., 1865, p. 220.

Shell slender, elongate-conic, uniformly golden-brown, shining. Nuclear whorls very small, planorboid, two and one-half, having their axis at right angles to that of the succeeding turns; not immersed. Post-nuclear whorls rather high between the sutures, slightly shouldered at the summit, flattened on the posterior three-fourths between the sutures; rounding on the anterior fourth to the somewhat contracted suture. Axial ribs slightly retractive, well rounded, 22 upon the first eight whorls, 24 upon the ninth, and 28 upon the tenth; on the penultimate whorl they are poorly developed, split, and otherwise indicating a senile stage. Sutures well impressed. Periphery and base of the last whorl inflated and well rounded. The entire surface of the base and spire marked by numerous fine, wavy, closely spaced spiral striations. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; also three bands of color upon a bluish-white surface, one immediately below the summit, another covering the part corresponding to posterior half of the base, and a narrow one dividing the space between these two areas in equal halves; columella curved, moderately strong, and revolute.

The specimen described and figured (Cat. no. 15315, U.S.N.M.) was collected by J. C. Cooper at San Pedro, California. It has 12 post-nuclear whorls and measures: Length 14 mm., diameter 3.6 mm.

TURBONILLA (PYRGOLAMPROS) PAINEI, new species.

Plate 5, figs. 4, 4*a*.

Shell very slender, horn-yellow with a chestnut band about two-fifths the width of the space between the sutures immediately below the summits, and another about one-third as wide dividing the light area of the spire into equal parts. Posterior half of base chestnut brown, anterior horn-yellow. Nuclear whorls small, two and one-fourth, depressed, helicoid, having their axis almost at right angles to that of the succeeding turns, in the first of which they are slightly immersed. Post-nuclear whorls slightly shouldered at the summit, weakly rounded, marked by strong, well rounded retractive axial ribs, of which 24 occur upon the first, 22 upon the second, 20 upon the third to fifth, and 22 upon the sixth to penultimate turn. Sutures well impressed, rendered somewhat wavy by the strong terminations of the ribs at the summit of the whorls. Periphery of the base inflated, well rounded. Base moderately long, well rounded, marked by the feeble continuations of the axial ribs. Entire surface of base and spire bearing fine, closely crowded, wavy spiral striations. Aperture large; posterior angle acute; outer lip thin, showing the external sculpture and color markings within; columella slender, straight, oblique, and slightly revolute.

The type (Cat. no. 205952, U.S.N.M.) was collected near Redondo, California. It has nine post-nuclear whorls and measures: Length 7.3 mm., diameter 2.2 mm. Cat. no. 171911, U.S.N.M., contains another specimen collected by S. S. Berry and J. H. Paine in 50 fathoms off Avalon, Catalina Island. Cat. no. 205953, U.S.N.M., one specimen collected by Mr. F. W. Kelsey in 35 fathoms off Coronado Hotel, San Diego; and Cat. no. 203507, U.S.N.M., one specimen collected by Mr. C. W. Gripp at San Diego, California.

Named for J. H. Paine.

TURBONILLA (PYRGOLAMPROS) KEEPI, new species.

Plate 5, fig. 1.

Shell elongate-conic, yellowish-white with a brown band about two-fifths the width of the space between the sutures, immediately below the summits, and one about one-third as wide, a little anterior to the middle of the remaining light area. Posterior half of base a little lighter brown than the bands between the sutures, grading into white on the anterior half. (Nuclear whorls decollated.) Post-nuclear whorls slightly shouldered, flattened, somewhat contracted at the periphery, marked by strong, well rounded, almost vertical axial ribs, of which there are 22 upon the fourth to sixth, 24 upon the seventh to ninth, 26 upon the tenth, and 30 upon the penultimate turn. Intercostal spaces a little narrower than the ribs, well impressed. Sutures strongly impressed, rendered sinuous by the strong terminations of the axial ribs at the summits of the whorls. Periphery of the last whorl well rounded. Base moderately long, well rounded. Entire surface of spire and base marked by numerous, very closely crowded, wavy, spiral striations. Aperture large; posterior angle acute; outer lip thin, showing the external sculpture and color bands within; columella very oblique, almost straight and slightly revolute.

The type (Cat. no. 173080, U.S.N.M.) was collected by Mr. Lowe at Long Beach, California. It has lost the nucleus and the first three post-nuclear whorls. The nine remaining measure: Length 11.7 mm., diameter 3.5 mm. The University of California has obtained this species at the following stations: 14 (3) off Point Firmin; 21 (2) off Catalina Island; 32 off Catalina Island; 73 off San Diego, California.

Named for Prof. Josiah Keep.

TURBONILLA (PYRGOLAMPROS) HALISTREPTA, new species.

Plate 5, fig. 2.

Shell elongate-conic, wax yellow with a broad subsutural, narrow submedian and a broad subperipheral band of golden brown. (Nuclear whorls decollated.) Post-nuclear whorls rather high between the sutures, very slightly shouldered, marked by almost obsolete, nearly vertical axial ribs, which are best developed near the summit and practically disappear before they reach the suture on the early whorls; on the last three they are scarcely indicated. Of these ribs there are about 28 upon the third and 24 upon the seventh whorl. Sutures well impressed. Periphery and the short base of the last whorl somewhat inflated, well rounded. Entire surface of spire and base marked by many well incised, closely spaced, wavy, spiral striations. Some of the fine lirations between the incised lines are a little darker colored than the rest of the surface and appear as reddish-brown hair lines. Aperture oval; posterior angle acute; outer lip thin, showing the external markings within; columella slender, strongly curved and moderately revolute.

The type (Cat. no. 205954, U.S.N.M.) was dredged by the University of California, off Newport, California. It has lost the nucleus and probably the first post-nuclear whorl; those remaining measure: Length 9.5 mm., diameter 2.7 mm. Two topotypes are in the collection of the University of California.

TURBONILLA (PYRGOLAMPROS) LITUYANA, new species.

Plate 5, fig. 8.

Shell elongate-conic, light wax yellow, with a supra and subperipheral light chestnut band, separated by a very narrow, dark wax yellow peripheral zone. (Nuclear whorls decollated.) Post-nuclear whorls rather high between the sutures, early ones with moderately strong, broad, low, almost vertical axial ribs, which become quite obsolete on the last turn and a half. About 22 of these ribs appear upon the eighth whorl. Intercostal spaces narrow and weakly impressed. Sutures well rounded. Periphery and base of the last whorl well rounded, the latter marked by continuations of the obsolete riblets and the fine, close, wavy spiral striations which also cover the entire surface of the spire. Aperture oval; posterior angle acute; outer lip thin; columella slender, oblique, slightly curved and revolute, with a slight fold at its insertion; parietal wall covered by a thin callus.

The type (Cat. no. 160208, U.S.N.M.) was collected by Dr. W. H. Dall, at Lituya Bay, Alaska. It has the last nine post-nuclear whorls, having lost the nucleus and probably the first two post-nuclear turns, and measures: Length 11.5 mm., diameter 3.7 mm. Two additional specimens (Cat. no. 160207, U.S.N.M.) were also collected by Doctor Dall in the same locality, in 8 fathoms, on sandy bottom.

TURBONILLA (PYRGOLAMPROS) OREGONENSIS Dall and Bartsch.

Plate 5, fig. 5.

Turbonilla (*Pyrgolampros*) *oregonensis* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 503, 504, pl. 45, fig. 2.

Shell elongate-conic, wax yellow, with two yellowish-brown spiral bands, the posterior one of which encircles the turns a little above the periphery, while the anterior one, which is a little wider, is immediately posterior to it, the two being separated by a space about as wide as the posterior band. (Nuclear whorls decollated in all our specimens.) Post-nuclear turns very slightly rounded, moderately contracted at the periphery, and closely appressed to the preceding turn at the summit. There are no well-defined ribs, the axial sculpture being reduced to mere lines of growth, with here and there a weakly impressed area, probably representing an obsolete intercostal space. Sutures strongly impressed. Periphery of the last whorl faintly angulated. Base short, well rounded. Entire surface marked by fine, regular, close, spiral striation. Aperture pyriform, posterior angle acute; outer lip thin, columella somewhat twisted, scarcely revolute at its free end.

The type has 8½ whorls remaining which measure: Length 8.5 mm., diameter 2.7 mm. It and another specimen (Cat. no. 181112, U.S.N.M.) were dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 2885, off Oregon, in 30 fathoms, with a bottom temperature of 49°.

Another specimen (Cat. no. 196222, U.S.N.M.) was dredged at station 2868, off the coast of Washington, in 31 fathoms, on gray sand, with a bottom temperature of 46.9°.

Subgenus **PYRGISCUS** Philippi.

Pyrgiscus PHILIPPI, Wieg. Arch., vol. 1, 1841, p. 50. Type, *Melania rufa* PHILIPPI=*Pyrgostelis* MONTEROSATO, Conch. Medit., 1884, p. 89, same type=*Ortostelis* ARADAS, Atti Dell Acad. Giov. di Catania, 1843, vol. 20, same type.

Turbonillas having prominent axial ribs and deeply incised spiral lines, but no varices or internal lirations on the outer lip. Columella usually somewhat flexuous.

Type.—*Melania rufa* Philippi.

KEY TO THE SPECIES OF THE SUBGENUS PYRGISCUS.

- Base without spiral sculpture.
  - Shell with a tuberculate cord near the summit .... *annettæ*, p. 76.
  - Shell without tuberculate cord near the summit .... *gracillima*, p. 77.
- Base with spiral sculpture.
  - Axial ribs terminating abruptly at the periphery.
    - Shell broadly conic.
      - Incised spirals between the sutures 6 of uniform strength .. *vexativa*, p. 77.
      - Incised spirals between the sutures 7 not of uniform strength . *obesa*, p. 78.
    - Shell elongate-conic.
      - Incised spirals between the sutures of uniform strength .... *favilla*, p. 78.
      - Incised spirals between the sutures not of uniform strength.
        - Spiral lines 5 strong and 3 slender .... *pequensis*, p. 79.
        - Spiral lines 7 strong and 6 slender .... *nuttingi*, p. 79.
        - Spiral lines 2 strong and 11 slender .... *callia*, p. 80.
        - Spiral lines 2 strong and 20 slender .... *superba*, p. 80.
  - Axial ribs passing feebly over the periphery, but evanescing before they reach the middle of the base.
    - Shell stout and very robust.
      - Axial ribs somewhat tuberculate .... *pluto*, p. 81.
      - Axial ribs not tuberculate .... *jewetti*, p. 82.
    - Shell broadly conic.
      - Incised spiral lines between the sutures of uniform strength.
        - Incised spirals between the sutures 6 .... *signæ*, p. 83.
        - Incised spirals between the sutures 7.
          - Intercostal spaces about as wide as the ribs .... *striosa*, p. 83.
          - Intercostal spaces double the width of the ribs.
            - Base with 13 well-incised spiral lines only ... *morchi*, p. 84.
            - Base with 15 well-incised lines and narrow spiral striations .... *aragoni*, p. 85.
        - Incised spirals between the sutures 8 .... *recta*, p. 85.

- Base with spiral sculpture—Continued.
  - Axial ribs passing feebly over the periphery, but evanescing before they reach the middle of the base—Continued.
    - Shell broadly conic—Continued.
      - Incised spirals between the sutures not of uniform strength.
        - Incised lines between the sutures all strong.
          - Incised spirals between the sutures 8................*veldi*, p. 86.
          - Incised spirals between the sutures 9..............*nereia*, p. 86.
        - Incised lines between the sutures partly strong and partly fine.
          - Base with 11 well-incised spiral lines.....*antestriata*, p. 87.
          - Base with 9 slender and numerous microscopic lines..........................*antemunda*, p. 88.
    - Shell elongate-conic.
      - Incised spiral lines between the sutures of uniform strength.
        - Spiral striations between the sutures more than 10.
          - Whorls well rounded.........................*flavescens*, p. 89.
          - Whorls flattened.
            - Spiral striations between the sutures 15....*macbridei*, p. 90.
            - Spiral striations between the sutures 30......*nuttalli*, p. 90.
        - Spiral striations between the sutures less than 10.
          - Spiral striations between the sutures 5........*macra*, p. 91.
          - Spiral striations between the sutures 6.......*angusta*, p. 91.
      - Incised spiral lines between the sutures not of uniform strength.
        - Incised spiral lines between the sutures all strong.
          - Summits of the whorls excurved...............*tenuicula*, p. 92.
          - Summits of the whorls not excurved.
            - Spacing regular.
              - Incised spirals 6 strong and 1 fine.........*virgo*, p. 93.
              - Incised spirals 7 strong and 3 fine......*marshalli*, p. 94.
            - Spacing irregular.
              - Whorls flattened.......................*canfieldi*, p. 95.
              - Whorls well rounded.....................*almo*, p. 95.
      - Incised spirals between the sutures consisting of well-impressed pits or lines and fine striations.
        - Spiral markings consisting of two strong series of pits, one the peripheral, the other the sub or supra-median and many fine striations.
          - Whorls strongly shouldered.
            - Incised spiral lines between the two pits 18.*callipeplum*, p. 96.
            - Incised spiral lines between the two pits 12....*dina*, p. 96.
          - Whorls not shouldered.
            - Whorls exserted at the summit..............*shimeki*, p. 97.
            - Whorls not exserted at the summit........*sanctorum*, p. 98.
        - Spiral markings consisting of more than two series of strong pits or lines and wavy fine striations.
          - Whorls exserted at the summit................*tenuicula*, p. 92.
          - Whorls not exserted at the summit.
            - Shell large, adult more than 11 mm....*eucosmobasis*, p. 98.
            - Shell smaller, adult less than 7 mm.......*halidoma*, p. 99.
  - Axial ribs extend over the base to the umbilical area.
    - Base of the last whorl very decidedly inflated.
      - Adult shell less than 8 mm. long........................*auricoma*, p. 100.
      - Adult shell more than 10 mm. long ....*castanea*, p. 101.

- Base with spiral sculpture—Continued.
  - Axial ribs extend over the base to the umbilical area—Continued.
    - Base of the last whorl not decidedly inflated.
      - Shell very large, adult more than 13 mm.............. *castanella*, p. 102.
      - Shell less than 10 mm.
        - Incised spiral lines between the sutures of uniform strength.
          - Whorls strongly shouldered.................... *indentata*, p. 102.
          - Whorls not strongly shouldered.
            - Incised spirals between the sutures 3........... *cora*, p. 103.
            - Incised spirals between the sutures 7.
              - Axial ribs 14-22...................... *craticulata*, p. 104.
              - Axial ribs 36-40....................... *cerulva*, p. 104.
            - Incised spirals between the sutures 8, or 8 on the early turns and 10 on the later ones.
              - Basal striations 5......................... *lepta*, p. 105.
              - Basal striations 12........... .... *histias*, p. 105.
            - Incised spirals between the sutures 9........ *subula*, p. 106.
      - Incised spiral lines between the sutures not of uniform strength.
        - Incised lines between the sutures all strong.
          - Shell large, adult more than 8 mm. long..... *wickhami*, p. 106.
          - Shell small, adult less than 6 mm. long.
            - Incised spiral lines between sutures 9......... *lara*, p. 107.
        - Incised spirals between the sutures consisting of strongly impressed pits or lines and fine striations.
          - Spiral pits 2, one peripheral and one median, fine lines 28. *cinctella*, p. 108.
          - Spiral pits 5, fine lines 5........................ *adusta*, p. 108.
          - Spiral pits 7, fine lines 4...................... *larunda*, p. 109.

TURBONILLA (PYRGISCUS) ANNETTÆ, new species.

Plate 7, fig. 7.

Shell very thin and delicate, yellowish-white. (Nuclear whorls decollated.) Post-nuclear whorls concave with a tuberculated shoulder a little below the summit, marked by strong, sinuous, slender, almost vertical axial ribs, of which 18 occur upon all but the penultimate whorl, the latter having 20. Intercostal spaces about four times as wide as the ribs, marked by seven broad, incised, spiral pits. The space between the first and second pit below the summit forms a rather strong raised spiral cord, the junction of which with the ribs renders them tuberculate. Periphery of the last whorl angulated. Base well rounded, marked by the feeble continuations of the axial ribs only. Aperture rhomboidal; posterior angle acute; outer lip thin, showing the external markings within; columella slender, curved and slightly revolute.

The type (Cat. no. 163265, U.S.N.M.) and another specimen were dredged at U. S. Bureau of Fisheries station 2792 in 401 fathoms, off Manta, Ecuador.

The type has the last six and one-half whorls and measures: Length 3.7 mm., diameter 1.3 mm.

TURBONILLA (PYRGISCUS) GRACILLIMA Carpenter.

Plate 7, fig. 9.

Chemnitzia gracillima CARPENTER, Cat. Mazatlan Shells, 1856, p. 431; not *Turbonilla gracillima* GABB, 1865, nor *Turbonilla gracillima* KOCH and WIECHMANN, 1872, not *Turbonilla gracillima* ALMERS and BOFILL, 1898.

Shell very slender, acute, milk-white. Nuclear whorls prolonged, partly lost. Post-nuclear whorls well rounded at first, later flattened, moderately contracted at the periphery and slightly shouldered at the summit, marked by slender, almost vertical, axial ribs, of which 12 occur upon the first, 14 upon the second and third, 16 upon the fourth, 18 upon the fifth and penultimate turn. Intercostal spaces as broad as the ribs, terminating suddenly at the periphery, crossed by about fourteen equal and equally spaced spiral pits, which are equal to the spaces which separate them. Periphery and base of the last whorl well rounded, without sculpture, smooth. Aperture rhomboidal; posterior angle obtuse; outer lip thin; columella slender, somewhat twisted.

Two specimens were collected off *Chama* at Mazatlan, Mexico; the larger of these has eight post-nuclear whorls, and measures: Length 3 mm., diameter 0.9 mm., and is on tablet 2001, Liverpool collection, British Museum.

TURBONILLA (PYRGISCUS) VEXATIVA, new species.

Plate 7, fig. 11.

Shell stout, chestnut brown. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, slightly rounded toward the appressed summit, and weakly contracted at the periphery, marked by weak, rounded, vertical axial ribs, which terminate abruptly at the periphery, of which 22 occur upon the fifth, 24 upon the sixth and seventh, and 26 upon the penultimate turn. Intercostal spaces about one and one-half times as wide as the ribs, marked by six equal and equally spaced spiral grooves, which divide the space between the sutures into seven equal parts. Sutures well impressed. Periphery of the last whorl angulated. Base short, marked by eight strongly incised spiral lines, which decrease in spacing from the periphery to the umbilical area. The space immediately behind the columella bears a number of closely spaced, fine, spiral striations. Aperture rhomboidal; posterior angle obtuse; outer lip thin, showing the external markings within; columella slender, somewhat twisted and slightly revolute.

The type (Cat. no. 160200, U.S.N.M.) was collected by Mr. E. W. Roper at San Pedro, California. It has lost the nucleus. The nine remaining whorls measure: Length 6.2 mm., diameter 2.1 mm.

TURBONILLA (PYRGISCUS) OBESA, new species.

Plate 7, figs. 3, 3*a*.

Shell robust, chocolate brown. Nuclear whorls small, deeply obliquely immersed in the first post-nuclear turn, above which only the tilted edge of the last one projects. Post-nuclear whorls flattened, moderately shouldered at the summit, marked by strong vertical axial ribs, which are decidedly contracted at their junctions with the spiral grooves, which lends them a somewhat nodulous aspect. Of these ribs, 16 appear on the first, 18 on the second, 20 upon the third to fifth, 22 on the sixth, and 24 on the penultimate turn. Intercostal spaces about as broad as the ribs, crossed by five strongly incised spiral grooves which almost cross the ribs. One of these is at the periphery. The remaining four appear in a double series; the one placed about as far below the summit as the other is above the periphery, the space between them being wider than that between the summit and the first pit below it. Two fine incised spiral lines mark the space between the summit and the first series of pits below it. Periphery of the last whorl marked by a broad plain band, well rounded. Base very short, well rounded, marked by about six unequal and unequally spaced strong incised lines. Aperture pear-shaped; posterior angle acute; outer lip thin, showing the external sculpture within; columella oblique, slightly revolute, provided with a moderately strong fold at its insertion.

The type (Cat. no. 162563 U.S.N.M.) was collected at Pacific Beach, California. It has eight post-nuclear whorls, and measures: Length 5.2 mm., diameter 1.8 mm.

TURBONILLA (PYRGISCUS) FAVILLA, new name.

Chemnitzia cœlata Carpenter, Ann. Mag. Nat. Hist., 3d ser., vol. 15, 1865, p. 400, not *Chemnitzia cœlata* Gould, Proc. Bost. Soc. Nat. Hist., vol. 3, 1861, p. 406.

"Shell quite large, elongate, ashy. (Nuclear whorls decollated.) Post-nuclear whorls 13, flattened, separated by weakly impressed sutures. Axial ribs 20 to 28, straight, subacute, suddenly truncated at the periphery. Intercostal spaces marked by 4 to 5 deeply impressed spiral grooves, which pass up on the sides of the ribs but do not cross their summits. Periphery of the last whorl angulated. Base short, marked by 6 spiral lines. Aperture subquadrate; columella strongly twisted. Length 8.8 mm., diameter 2.3 mm."

The above is Doctor Carpenter's description, to which he adds: "This beautiful and unique shell was probably from Panama; but there was no locality mark. It is remarkable for its deep furrow and the suddenly shortened and spirally sculptured base. It is much larger and broader than the northern *C. virgo*, and differs in details of sculpture." We have not seen this species.

TURBONILLA (PYRGISCUS) PEQUENSIS, new species.

Plate 7, figs. 5, 5*a*.

Shell slender, light yellow, with a broad golden band encircling the whorls in the middle between the sutures, and another a little wider immediately posterior to the periphery. Nuclear whorls two, planorboid, having their axis almost at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls flattened in the middle, with a strong sloping shoulder, which occupies about one-fifth of the space between the sutures; somewhat contracted at the periphery, marked by moderately strong, slightly protractive axial ribs, which are strongest at the angle of the shoulder and terminate at the periphery. Of these ribs there are 14 upon the first to third and 16 upon the remaining turns. Intercostal spaces almost as wide as the ribs, shallow, marked by eight equal, strongly incised, but unequally spaced spiral grooves; the three immediately posterior to the periphery being a little more closely spaced than the rest. Two feebly incised fine lines divide the space between the summit and the first strong line and that between the first and second. These fine lines are best shown on the last whorls. Sutures well impressed. Base short, well rounded, marked by about a dozen very fine, wavy spiral striations. Aperture rhomboid; outer lip thin, showing the external sculpture within; columella somewhat twisted, slightly revolute, provided with an oblique fold at its insertion.

The type (Cat. no. 97019, U.S.N.M.) has eight post-nuclear whorls, and measures: Length 4.6 mm., diameter 1.8 mm. It was collected at U. S. Bureau of Fisheries station 2834, near Point Abreojos, in 12 fathoms, on sand bottom, off Lower California.

TURBONILLA (PYRGISCUS) NUTTINGI, new species.

Plate 7, figs. 13, 13*a*.

Shell long and slender, wax yellow on the posterior half between the sutures, light brown on the anterior and the periphery. Nuclear whorls large, two and one-half, forming a depressed helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Post-nuclear whorls moderately well rounded, slightly shouldered at the summit, marked by strong, broad, well rounded, somewhat protractive axial ribs, of which 20 occur upon the first to sixth, 22 upon the seventh to ninth, and 24 upon the penultimate turn. These ribs extend prominently from the summit to the periphery of the whorls, but do not cross the latter. Intercostal spaces very narrow, not more than half the width of the ribs; anterior half between the sutures marked by five equal and equally spaced spiral grooves; posterior half marked by two which equal those on the anterior half in strength, but are a little more distantly spaced, and six fine incised lines which divide the space posterior to the last groove. Sutures somewhat constricted. Periphery of the last whorl well rounded. Base short, well rounded, marked by nine slender incised spiral lines, which are successively a little closer spaced from the periphery to the umbilical region. Aperture rhomboid; posterior angle obtuse; outer lip thin, showing the external markings within; columella slender, somewhat curved and slightly revolute.

The type (Cat. no. 160067 U.S.N.M.) was dredged by Mr. F. W. Kelsey in twenty fathoms off San Diego. It has eleven post-nuclear whorls and measures: Length 12.3 mm., diameter 1.6 mm.

Named for Prof. C. C. Nutting.

The following specimens have been examined:

U. S. N. M. cat. no.	No. of specimens.	U. S. B. F. station.	Locality.	Depth, fathoms.	Disposition of material.
160067	1		Off San Diego, California	20	U. S. Nat. Mus.
173075	2		Northwest of San Diego, California	50	Do.
152752	3		Off San Pedro, California	8	Do.
	1	28	Off San Diego, California		Univ. Cal. coll.
	1	28	San Diego, California	50	Kelsey coll.

TURBONILLA (PYRGISCUS) CALLIA, new species.

Plate 7, fig. 4.

Shell elongate-conic, yellowish-white. Nuclear whorls decollated. Post-nuclear whorls moderately well rounded, ornamented by rather weak, slightly protractive, axial ribs, of which 16 occur upon the first four of the remaining turns and 18 upon the rest. Intercostal spaces shallow, double the width of the ribs, marked by two lines of pits, one of which is at the periphery, the other a little posterior to the middle of the whorls and a series of finer incised lines of which seven irregularly spaced ones occur between the two rows of pits and four between the upper row of pits and the summit. Sutures well impressed. Periphery of the last whorl well rounded. Base short, well rounded, marked by several well incised spiral striations. Aperture subquadrate; posterior angle obtuse; outer lip thin, strongly bent at its anterior margin; columella short, twisted and slightly revolute.

The type (Cat. no. 205936, U.S.N.M.) was collected at San Diego, California. It has lost the early whorls. The nine remaining measure: Length 4.7 mm., diameter 1.4 mm.

TURBONILLA (PYRGISCUS) SUPERBA, new species.

Plate 7, figs. 10, 10*a*.

Shell elongate-conic, pale yellow with a darker broad yellow band a little posterior to the middle of the whorls between the sutures, and another of about equal width at the periphery. Nuclear whorls one and three-fourths, moderately large, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls well rounded, the strongest convexity falling a little anterior to the middle between the sutures, appressed at the summit, marked by strong, sublamellar, slightly protractive axial ribs, of which 16 occur upon the first to seventh whorl, 18 upon the eighth, 20 upon the ninth and the penultimate turn. Intercostal spaces about three times as wide as the ribs, shallow, marked by a series of deep spiral pits, at the periphery and another a little posterior to the middle of the whorls. The space between the peripheral and the median pits is crossed by ten unequal and unequally spaced, fine spiral striations. The space between the median row of pits and the summit is crossed by ten incised spiral lines of similar character. Sutures well impressed. Periphery of the last whorl slightly angulated. Base short, well rounded, marked by about thirteen fine, well incised, equal and equally spaced spiral striations. Aperture rhomboid; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella straight, oblique and revolute, provided with a weak fold at its insertion.

The type (Cat. no. 163261, U.S.N.M.) has eleven post-nuclear whorls and measures: Length 6.5 mm., diameter 1.6. mm. It and two additional specimens were dredged at U. S. Bureau of Fisheries station 2822, in 21 fathoms, gray sand and broken shells, off La Paz, Lower California.

TURBONILLA (PYRGISCUS) PLUTO, new species.

Plate 9, fig. 9.

Shell very robust, chestnut brown. (Nuclear whorls decollated.) Post-nuclear whorls flattened, moderately shouldered at the summit and scarcely at all contracted at the sutures, marked by rather irregular, low, rounded, variously slanting axial ribs which are completely eroded on the first four whorls, on the fifth and sixth there are 24, on the seventh and the penultimate there are 38. Intercostal spaces a little narrower than the ribs, marked by four spiral series of broad strongly impressed spiral pits, on the anterior two-thirds of the whorls between the sutures; the posterior third is marked by two closely spaced, well incised, strong spiral lines, the first of which is about as far posterior to the neighboring pit as the space which separates that from its fellow. Both spiral pits and lines cut strongly into the sides of the ribs and pass feebly over their summits, rendering them somewhat tuberculate. Sutures well impressed. Periphery of the last whorl marked by a plain band, well rounded. Base moderately long, well rounded, marked by the very feeble continuations of the axial ribs and six equal and equally spaced, broad and deeply incised spiral lines. Aperture pear shaped; posterior angle acute; outer lip rather thick; columella short, oblique and somewhat revolute.

The type (Cat. no. 206866, U.S.N.M.) was dredged in 10 fathoms, off San Pedro, California. It has nine post-nuclear whorls and measures: Length 7.5 mm., diameter 2.3 mm.

TURBONILLA (PYRGISCUS) JEWETTI, new species.

Plate 7, figs. 2, *2a*.

Shell short, robust, rose pink, wax yellow at tip. Nuclear whorls two and one-half, very small, low, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-third immersed. Post-nuclear whorls flattened, shouldered at the summit, marked by strong, rounded, slightly protractive axial ribs; of which 18 occur upon the second, 20 upon the third, 22 upon the fourth and fifth, 24 upon the sixth, and 26 upon the penultimate turn. Intercostal spaces about equal to the ribs, strongly impressed, marked by five series of equal and equally spaced spiral pits, the first of which is at the periphery, the last a little farther from the summit than its neighbor. Sutures strongly marked, rendered sinuous by the ribs. Periphery of the last whorl rounded, marked by the feeble continuations of the axial ribs. Base moderately long, well rounded, marked by eight unequal and unequally spaced spiral striations, the two immediately below the periphery being stronger than the rest and somewhat interrupted. Aperture oval; outer lip thick within, columella stout, somewhat twisted and slightly revolute.

The type (Cat. no. 153048, U.S.N.M.) and another specimen were obtained at low tide at San Diego, California. The type has eight post-nuclear whorls and measures: Length 5.5 mm., diameter 1.9 mm.

Named for the late Col. Ezekiel Jewett.

We have examined the following specimens:

U.S.N.M. cat. no.	Number of specimens.	U. S. B. F. station.	Locality.	Depth, fathoms.	Disposition of material.
153048	2	....	Off San Diego, California........................		U. S. Nat. Mus.
163263	1	....	....do..		Do.
109519	1	....	Terminal Island, California......................		Do.
162564	1	....	Pacific Beach, California........................		Do.
152316	2	....	Ocean Beach, California..........................		Do.
	1	....	Arch Beach, California...........................		Univ. Cal. coll.
	1	....	San Pedro, California............................		Lowe coll.
46507	1	....	Todos Santos Bay, Lower California.	....	U. S. Nat. Mus.
162565	4	....	San Hipolito Point, Lower California.	....	Do.
162566	1	2835	Lower California..................	5.5	Do.

TURBONILLA (PYRGISCUS) SIGNÆ, new species.

Plate 7, fig. 1.

Shell elongate-conic, of very regular outline, wax yellow, variegated with ashy. (Nuclear whorls decollated.) Post-nuclear whorls very flat, with appressed summits, scarcely at all contracted at the periphery, marked by low, rounded, slightly sinuous, somewhat protractive axial ribs, of which 22 occur upon the second, 24 upon the third, 26 upon the fourth, 28 upon the fifth, 30 upon the sixth, 36 upon the seventh, 46 upon the eighth, and, of those remaining, the same number upon the penultimate turn. Intercostal spaces about half as wide as the ribs, marked by six equal and equally spaced spiral rows of pits, the last of which is at a little greater distance from the summit than its fellow. Sutures very faintly indicated. Periphery of the last whorl somewhat angulated. Base short, well rounded, marked by about a dozen fine, wavy, equal and equally spaced spiral lines. Aperture rhomboidal; outer lip thick; columella moderately strong, slightly sinuous and somewhat reflected.

The type (Cat. no. 160210, U.S.N.M.) was collected by Mr. Roper at San Pedro, California. It has lost the nucleus and probably the first three post-nuclear whorls. The ten remaining measure: Length 10.2 mm., diameter 2.7 mm.

TURBONILLA (PYRGISCUS) STRIOSA C. B. Adams.

Plate 7, figs. 8, 8*a*.

Chemnitzia striosa C. B. Adams, Ann. Lyc. Nat. Hist. of N. Y., 1852, p. 393.

Shell elongate-conic, wax yellow, nuclear whorls at least two, forming a planorboid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls moderately rounded, feebly shouldered at the summit, very slightly contracted at the sutures, marked by poorly developed axial ribs which are scarcely at all expressed on the first two whorls, and become decidedly weakened and irregular on the last. Of these ribs there are 24 upon the third to fifth, 26 upon the sixth, and 28 on the seventh whorl. Intercostal spaces as irregular as the ribs and usually a little wider, marked by six equally strong, and equally spaced, incised spiral lines, which become quite irregular on the last whorl. Sutures well impressed. Periphery and base of the last whorl well rounded, the latter marked by six equally strong incised spiral lines. Aperture moderately large, oval; outer lip thin, showing the external sculpture within; columella slender, twisted and slightly revolute.

Professor Adams's type, which has served for our description and figure, is in the Amherst College collection and comes from Panama. It has nine post-nuclear whorls and measures: Length 5.4 mm., diameter 1.5 mm.

TURBONILLA (PYRGISCUS) MÖRCHI Dall and Bartsch.

Plate 7, figs. 6, 6*a*.

Turbonilla (*Pyrgiscus*) *mörchi* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 505, 506, pl. 45, figs. 1, 1*a*.

Shell broadly elongate-conic, the posterior third of the exposed portion of the whorls on the spire and a narrow area about the umbilical region flesh-colored, the rest of the shell light chestnut brown. Nuclear whorls two and one-half, small, smooth, forming a depressed helicoid spire which has its axis at right angles to the axis of the succeeding turns and is about one-fifth immersed in the first of them. Exposed portion of the post-nuclear whorls flattened in the middle, posterior fourth sloping gently toward the summit, which is closely appressed to the preceding turn; the anterior portion slopes more abruptly, roundly toward the periphery. The whorls are ornamented by strong rather distantly spaced, moderately acute, slightly protractive axial ribs, of which 18 occur upon the first three, 16 on the next three, 18 on the seventh, and 20 upon the penultimate turn. The ribs weaken slightly and become somewhat flattened as they approach the constricted sutures. Intercostal spaces broad, almost double the width of the ribs, crossed by 7, equal and equally spaced, deeply incised spiral lines, which extend up on the sides of the ribs and feebly across them. The space between the second and third lines appears slightly nodulose on the ribs. Periphery of the last turn angulated, crossed by the continuations of the ribs, which disappear as they pass on to the short and well-rounded base. Base marked by 13 continuous incised spiral lines of about equal strength which are much more closely spaced near the umbilicus than the periphery, the distance between the succeeding striations diminishing in regular ratio from the periphery to the umbilical area, the first two below the periphery being considerably more distantly spaced than the rest, the spaces inclosed between them being about equal to the space inclosed between the spiral lines on the spire. Aperture subquadrate, posterior angle acute, outer lip thin, showing the external sculpture within; columella slender, oblique, somewhat twisted and slightly revolute.

The type (Cat. no. 173081, U.S.N.M.) has nine post-nuclear whorls and measures: Length 6.4 mm., diameter 2 mm. It was collected by Mr. H. N. Lowe at Long Beach, California. Another specimen is in the collection of the University of California from station 122, near Redondo. Another (Cat. no. 176622, U.S.N.M.) was dredged by Mr. John Paine in 8 fathoms off Catalina Island. Five (Cat. no. 196230, U.S.N.M.) were collected by Mr. H. N. Lowe at San Diego, and four additional specimens from the same locality are in Mr. Lowe's collection. One, collected at station 83, off San Diego, is in the collection of the University of California.

This species is nearest related to *Turbonilla* (*Pyrgiscus*) *latifundia* Dall and Bartsch, from the post-Pliocene of San Pedro, California.

TURBONILLA (PYRGISCUS) ARAGONI, new species.

Plate 9, figs. 12, 12*a*.

Shell elongate-conic, anterior half of whorls chestnut brown, the rest, flesh colored. Nuclear whorls two, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is one-fifth immersed. Post-nuclear whorls well rounded, slightly contracted at the suture, appressed at the summit, marked by acute vertical axial ribs, of which 16 occur upon the first to seventh, 20 upon the eighth, and 26 upon the penultimate turn. Intercostal spaces about two and one-half times as wide as the ribs, marked by fine lines of growth and seven strongly incised spiral grooves, and numerous exceedingly fine, spiral striations. Sutures slightly contracted. Periphery of the last whorl slightly angulated, marked by a narrow plain band. Base short, well rounded, marked by fifteen well incised and numerous very fine spiral lines. Aperture rhomboidal, posterior angle obtuse; outer lip thin, showing the external markings within; columella slender, slightly curved.

The type (Cat. no. 206867, U.S.N.M.) was dredged by Mr. S. S. Berry, in 29 fathoms, on sandy bottom, off New Monterey, Monterey Bay. It has ten post-nuclear whorls and measures: Length 7.2 mm., diameter 2 mm.

TURBONILLA (PYRGISCUS) RECTA, new species.

Plate 7, figs. 12, 12*a*.

Shell broadly conic, milk-white. Nuclear whorls small, two and one-half, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-third immersed. Post-nuclear whorls slightly rounded, somewhat exserted, weakly shouldered at the summit, marked by slender, protractive axial ribs, of which 22 occur upon the second, 24 upon the third, 28 upon the fourth and fifth, and 30 upon the penultimate whorl. Intercostal spaces about as wide as the ribs, marked by eight equal and equally spaced spiral series of pits. Sutures strongly marked, crenulated by the ribs. Periphery of the last whorl well rounded, appearing as a broad plain band, marked only by the feeble continuations of the axial ribs. Base short, well rounded, marked by ten equal and almost equally spaced spiral striations. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, strongly curved, slightly revolute, with a weak fold at its insertion.

The type (Cat. no. 162635, U.S.N.M.) comes from Point Abreojos, Lower California. It has seven post-nuclear whorls and measures: Length 3.6 mm., diameter 1.3 mm. Another specimen (Cat. no. 162634, U.S.N.M.) comes from San Diego, California.

TURBONILLA (PYRGISCUS) WELDI, new species.

Plate 8, fig. 11.

Shell large, chestnut brown with a broad peripheral light band, and a light area about the columella. (Nuclear whorls decollated.) Post-nuclear whorls well rounded, somewhat overhanging, strongly contracted at the suture, appressed at the summit, marked by moderately strong, rounded, slightly retractive axial ribs, of which 24 occur upon the third to fifth, 28 upon the sixth, and about 35 upon the penultimate turn, upon which they are less regular than on the others. Intercostal spaces a little wider than the ribs, marked by eight broad, deep spiral series of pits which are subequal, excepting the three above the peripheral one, the median one of which is much narrower than the rest. Sutures strongly constricted. Periphery and base of the last whorl inflated, well rounded, marked by the feeble continuations of the axial ribs, a broad line of pits immediately below the periphery, and seven equal and equally spaced, broad, well incised spiral lines. Aperture large, broadly oval, posterior angle acute; outer lip very strongly curved, thin, showing the external markings within; columella slender, twisted, curved and slightly revolute.

The type (Cat. no. 206868, U.S.N.M.) was dredged by the University of California at station 14, off Point Fermin, California. It has lost the nucleus and probably the first post-nuclear whorl. The eight remaining whorls measure: Length 8.8 mm., diameter 2.7 mm.

Named for Prof. Laenas G. Weld.

TURBONILLA (PYRGISCUS) NEREIA, new species.

Plate 8, figs. 1, 1*a*.

Shell broadly conic, pale yellow, with a broad dark wax yellow band, which extends over a little more than one-half the distance from the middle of the whorls to the summit, between the sutures. A secondary of the same color extends from a little posterior to the periphery to the middle of the base. Nuclear whorls small, two and one-half, forming a depressed helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which they are very slightly immersed. Post-nuclear whorls flattened in the middle, slightly rounded at the summit and at the periphery, ornamented by well rounded, strong, almost vertical axial ribs, which become weakened toward the summit. These ribs are scarcely indicated on the first and second whorls, upon the third and fourth there are 20, upon the remaining (excepting the penultimate whorl which has 20) there are 18. Intercostal spaces about double as wide as the ribs, marked by nine spiral series of pits, all of which pass strongly upon the sides of the ribs, but do not cross their summits.

Of these pits the peripheral one and the three anterior to the one at the summit are stronger than the rest; the space separated by the second and third below the summit is a little wider than the rest, and the pits biting in the ribs render these somewhat nodulose at this place. Sutures well impressed. Periphery of the last whorl well rounded. Base moderately long, well rounded, marked by the continuations of the axial ribs which extend feebly to the umbilical region, and about eight weakly incised spiral lines, those nearest the periphery being somewhat interrupted by the ribs. Aperture suboval; posterior angle acute; outer lip thin, showing the external markings within; columella slender, slightly twisted and very oblique.

The type (Cat. no. 206869, U.S.N.M.) comes from San Diego. It has ten post-nuclear whorls and measures: Length 5.8 mm., diameter 1.7 mm. Cat. no. 163260, U.S.N.M., contains another specimen, collected by Mrs. Oldroyd at San Pedro, California.

TURBONILLA (PYRGISCUS) ANTESTRIATA Dall and Bartsch.

Plate 8, figs. 5, 5*a*.

Turbonilla (*Pyrgiscus*) *antestriata* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 506, 507, pl. 45, figs. 4, 4*a*.

Shell large and strong, light brown. Nuclear whorls two and one-half, small, smooth, forming a depressed rounded helicoid spire, which projects somewhat beyond the left side of the outline of the spire of the later whorls and has its axis at a right angle to the axis of these, being about one-fourth immersed in the first turn. Post-nuclear whorls slightly rounded, ornamented by low, rounded, narrow, vertical axial ribs which become decidedly flattened and enfeebled near the summit of the turns; there are 9 of these ribs on the second, 20 upon the fifth, and 28 upon the penultimate post-nuclear turns. Intercostal spaces about double the width of the ribs, shallow, rounded, crossed by 6 equal and equally spaced, strongly incised, spiral lines which extend stronger upon the sides of the ribs and feebly over their summits. In addition to this sculpture, the spire is marked by many fine lines of growth and many fine spiral striations between the incised lines. Sutures well marked, simple. Periphery of the last whorl subangulated, marked by the feeble continuations of the axial ribs, which disappear at the periphery. Base short, marked by 11 continuous, equal, strong, incised spiral lines which are more closely spaced above the umbilical area than at the periphery; the space between the first basal incised line and the first supraperipheral one being a little wider than the space inclosed between the spiral lines on the spire. Aperture subquadrate, outer lip thin, showing the external sculpture within; columella almost straight and vertical, slightly revolute.

The above description is based upon two cotypes. One, an adult shell (Cat. no. 168867, U.S.N.M.), has the last 10 whorls, having lost the nucleus and probably the first two and one-half post-nuclear turns, and measures: Length 9.7 mm., diameter 2.8 mm. It was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 3194 in 92 fathoms, on gray sand, bottom temperature 45°.9, off Esteros Bay, California. The other (Cat. no. 196232, U.S.N.M.) was collected by Mrs. Oldroyd at San Pedro, California, and has the nucleus and 9 post-nuclear turns, and measures: Length 5.5 mm., diameter 1.8 mm. Three specimens (Cat. no. 196233, U.S.N.M.) were dredged by the Fisheries steamer *Albatross* at station 2902 in 53 fathoms, fine gray sand and mud bottom, temperature 45°, off Santa Rosa Island. One in the collection of the University of California comes from station 122, near Redondo; another in the same institution was dredged at station 12, off Point Vincent. Two (Cat. no. 196231, U.S.N.M.) were dredged in 12 fathoms at San Pedro by Mr. H. N. Lowe. Another specimen was dredged by the University of California at station 30, off Catalina Island, and two at station 58, off San Diego, California, the last two lots being in the University collection.

TURBONILLA (PYRGISCUS) ANTEMUNDA, new species.

Plate 8, figs. 15, 15*a*.

Shell broadly conic, milk-white with a moderately broad pale yellow band at the periphery and another at the middle of the whorls between the sutures of the same width. Nuclear whorls two and three-fourths, helicoid, having its axis at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls moderately rounded, appressed at the summit, strongly contracted at the periphery, somewhat overhanging, ornamented by well-developed, narrow axial ribs, which become decidedly enfeebled toward the summit. Of these there are 16 upon the first to fourth, 18 upon the fifth to seventh, 20 upon the eighth, 22 upon the ninth and penultimate whorl. Intercostal spaces about two and one-half times as wide as the ribs, ornamented with a double series of spiral markings, the first of which consists of seven strongly incised and subequally spaced pits between the sutures, the third and fourth of which above the periphery bound the color band and are a little closer spaced than the rest. The first one below the summit passes over the axial ribs and gives them a truncated appearance; the others pass up on the sides of the ribs but do not cross them. The second series of spiral markings consist of very fine lines, of which three occur between the peripheral series of pits and the second two occur between the second and third, one between the fourth and fifth, two between the sixth and seventh. In addition to this sculpture there are many microscopic lines of growth and microscopic spiral striations. Sutures well marked. Periphery of the last whorl somewhat angulated, marked by the feeble extensions of the axial ribs. Base short, well rounded, smooth, excepting the fine lines of growth and exceedingly fine, weakly incised spiral striations, among which about nine equal and equally spaced are a trifle stronger than the rest. Aperture rhomboid; outer lip thin, showing the external sculpture within; columella moderately strong and slightly revolute.

The above description is based on two cotypes (Cat. no. 168866, U.S.N.M.). This has furnished the description of the adult shell. It has lost the nucleus and first post-nuclear whorl. The ten remaining measure: Length 6.9 mm., diameter 2.2 mm. The other is a young individual and has served for the description of the nucleus and first post-nuclear whorl. These were dredged at U. S. Bureau of Fisheries, station 2901, off Santa Rosa Island, California.

The following specimens have been examined:

U.S.N.M. cat. no.	No. of specimens.	U.S.B.F. station.	Locality.	Depth, fathoms.	Temp. degrees.	Disposition of material.
168866	2	2901	Santa Rosa Island, California.	48	55.1	U. S. Nat. Mus.
206872	20	2902	do.	53	45	Do.
	1		Off Catalina Island, California, sta. 32.			Univ. Cal.

TURBONILLA (PYRGISCUS) FLAVESCENS Carpenter.

Plate 8, fig. 9.

Chemnitzia flavescens Carpenter, Cat. Maz. Shells, 1856, p. 432.

Shell slender, yellowish. Nuclear whorls two and one-half, forming a helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls at first well rounded, later flattened, marked by slender, somewhat curved, almost vertical axial ribs, of which 18 occur upon the first, 20 upon the second, 22 upon the third and remaining whorls. Intercostal spaces about twice as wide as the ribs, marked by numerous fine, closely spaced spiral striations. Periphery and base of the last whorl well rounded, marked by the feeble continuations of the axial ribs, and many fine spiral striations. Aperture oval; posterior angle acute; outer lip thin; columella slender, strongly curved.

The single specimen of this shell known is on tablet 2003, Havre collection, British Museum, and was taken from a specimen of *Spondylus calcifer* at Mazatlan, Mexico. It has six post-nuclear whorls, the aperture being badly broken, and measures: Length 2.75 mm., diameter 0.8 mm.

TURBONILLA (PYRGISCUS) MACBRIDEI, new species.

Plate 8, figs. 13, 13*a*.

Shell exceedingly slender, light yellow, with a broader darker yellow band immediately below the summit and another halfway between this and the suture. Nuclear whorls large, one and three-fourths, forming a depressed helicoid spire, the axis of which is at right angles to that of the succeeding turns, on the first of which it rests, but is not immersed. Post-nuclear whorls exceedingly high between the sutures, moderately rounded, marked by slender, very regular, slightly curved, well rounded, somewhat retractive axial ribs, of which 24 occur upon the first, 22 upon the second and third, 24 upon the fourth and fifth, 26 upon the sixth and seventh, and about 32 upon the penultimate whorl. Intercostal spaces about as wide as the ribs, well impressed, marked by fifteen equal and equally spaced spiral series of pits, which owing to the narrowness of the intercostal spaces, appear as mere punctations. Sutures well marked. Periphery of the last whorl without spiral sculpture. Base moderately long, marked by the continuations of the axial ribs, and six equal and equally spaced spiral striations on its anterior two-thirds. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, decidedly flexuose, and very slightly revolute.

The type (Cat. no. 191563 U.S.N.M.) of this exceedingly slender shell comes from U. S. Bureau of Fisheries, station 2826, in 9½ fathoms, off La Paz, Lower California. It has nine post-nuclear whorls, and measures: Length 4 mm., diameter 0.8 mm.

Named for Prof. Thomas H. Macbride.

TURBONILLA (PYRGISCUS) NUTTALLI, new species.

Plate 8, fig. 2.

Shell large, elongate-conic, yellowish-white, with a light-brown area about the columella. (Nuclear whorls decollated.) Post-nuclear whorls well rounded, slightly shouldered at the summit, scarcely at all contracted at the periphery; marked by strong, narrow, well rounded, slightly protractive axial ribs, of which 14 occur upon the third, 16 upon the fourth to eighth, and 18 upon the remaining turns. Intercostal spaces about one and one-half times as wide as the ribs, shallow, marked by about 30 incised spiral lines which are strongest at the periphery and gradually weaken toward the summit. A moderately broad, plain area on the middle between the sutures is left unmarked. Periphery and base of the last whorl well rounded, marked by the feeble continuations of the axial ribs and numerous exceedingly fine, closely spaced, wavy, spiral striations. Aperture small, rhomboidal; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella strong, straight, and revolute.

The type (Cat. no. 56791, U.S.N.M.) is labeled "South America," without specific designation of locality. It has lost the nucleus and probably the first post-nuclear turn. The thirteen remaining measure: Length 9.9 mm., diameter 2.1 mm.

Named for Thomas Nuttall.

TURBONILLA (PYRGISCUS) MACRA, new species.

Plate 8, figs. 10, 10*a*.

Shell very small, subcylindric in the middle, tapering rapidly at the apex, early whorls wax-yellow, later ones white, with a very broad, wax-yellow band at the periphery, which extends above the sutures and on the base. Nuclear whorls very small, at least two, forming a depressed helicoid spire, which is obliquely half immersed in the first of the succeeding turns. Post-nuclear whorls moderately rounded at first, later flattened, ornamented by almost straight, vertical, slender, well-developed axial ribs, of which there are 22 upon the first, 24 upon the second to fifth, and 25 upon the penultimate turn. Intercostal spaces about as wide as the ribs, marked by five equal but not equally spaced series of spiral pits. The first four of these above the periphery are equally spaced; the fifth is a little nearer to the summit of the whorl than its neighbor. Sutures well impressed. Periphery of the last whorl well rounded, marked by the feeble continuations of the axial ribs. Base of the last whorl prolonged, well rounded, marked by six equally spaced and equally strongly incised spiral lines. Aperture ovate; posterior angle acute; outer lip thin, showing the external markings within; columella moderately strong, reënforced by the base, provided with a weak fold at its insertion; parietal wall covered with a thin callus.

The type (Cat. no. 162632, U.S.N.M.) and five other specimens were obtained at Point Abreojos, Lower California. The type has seven post-nuclear whorls, and measures: Length 3.2 mm., diameter 0.9 mm.

TURBONILLA (PYRGISCUS) ANGUSTA Carpenter.

Plate 8, fig. 6.

Chrysallida angusta CARPENTER, Ann. Mag. Nat. Hist., (3d ser.,) vol. 14, 1864, p. 47.

Shell elongate-conic, slender, crystalline. (Nuclear whorls decollated.) Post-nuclear whorls slightly rounded, moderately contracted at the sutures, slightly shouldered at the summit, marked by low, rounded, axial ribs, of which 16 occur upon all but the penultimate whorl, upon which there are 18. Intercostal spaces about one and one-half times as wide as the ribs, marked by 6 equal and equally spaced spiral lirations between the sutures. Base somewhat produced, moderately rounded, marked by the feeble continuations of the axial ribs and nine spiral lirations which become successively weaker from the periphery to the umbilical area. Aperture oval;

posterior angle acute; outer lip thin, showing the external sculpture within; columella stout, somewhat reflected.

The type (Cat. no. 16212, U.S.N.M.,) was collected by Xantus at Cape St. Lucas, Lower California. It has 6 post-nuclear whorls, and measures: Length 2.3 mm., diameter 0.8 mm.

TURBONILLA (PYRGISCUS) TENUICULA Gould.

Plate 8, figs. 3, 7, 7*a*, 12, 12*a*, 14, 14*a*.

Chemnitzia tenuicula Gould, Bost. Journ. Nat. Hist., vol. 6, 1853, pp. 383–384, pl. 14, fig. 15.=*Chemnitzia terebralis* Carpenter, Cat. Mazatlan Shells, 1856, p. 432.=*Chemnitzia unifasciata* Carpenter, Cat. Mazatlan Shells, 1856, p. 433. =*Chemnitzia* ? var. *subcuspidata* Carpenter, Rept. Brit. Assn. Adv. Sci., 1863, p. 659.=*Chemnitzia crebrifilata* Carpenter, Rept. Brit. Assn. Adv. Sci., 1863, p. 659.=*Turbonilla* (*Pyrgiscus*) *crebrifilata* (Carpenter) Dall and Bartsch, Mem. Cal. Acad. Sci., vol. 3, 1903, p. 276, pl. 2, figs. 6, 6*a*.=*Turbonilla* (*Pyrgiscus*) *subcuspidata* (Carpenter) Dall and Bartsch, Mem. Cal. Acad. Sci., vol. 3, pp. 276–277, pl. 2, figs. 2, 2*a*.

"Shell small, elongated, lanceolate, turrited, rather solid, shining, wax yellow, a little dusky below the suture; whorls 10, flat, slightly shouldered above, marked by about 20 direct, longitudinal folds, the summits of which are cut by numerous fine revolving striæ, deeper in the interstices, which also extend over the base of the shell, though the folds terminate at the periphery, or are extended in delicate furrows; aperture narrow, ovate; lip sharp; revolving striæ apparent within.

Dimensions.—Length 7.5 mm.; diameter 1.3 mm.

Found at Santa Barbara."

The above is the original description by Gould. *Turbonilla* (*Pyrgiscus*) *tenuicula* Gould is the most abundant and most variable species of all the west American forms, presenting many varieties or incipient species; to describe these would not aid science or the collector, but would only add to the confusion which this paper is intended to dispel. The following comprehensive description will embrace, we believe, all the forms coming under this name:

Shell slender to somewhat stubby and inflated, varying in color from milk-white to waxy yellow or to dark brown, variously banded or plain monocolored; nuclear whorls three, moderately large, planorboid, slightly slantingly immersed; post-nuclear whorls rounded to flattened, contracted at base and strongly shouldered at the summit, traversed by 18 to 28 strong vertical ribs, which are excurved and usually somewhat thickened, and connected at their summits, which appear beaded; these ribs extend feebly over the rounded base of the last whorl; the entire shell is crossed by incised spiral lines, 10 to 16 or more of which appear on the exposed portion of the whorls, and more, closer placed, wavy ones on the base of the last whorl; the suture is deep, subchanneled and wavy; aperture ovate, produced at base; outer lip thin, meeting the oblique, slightly curved and revolute columella in a broad curve; a faint callus connects the posterior angle of the aperture with the insertion of the columella.

The specimen figured is from Todos Santos Bay, Lower California, has 9 post-nuclear whorls and measures: Length 6.5 mm., diameter 1.9 mm. Figures 12 and 12*a* represent the forms described by Carpenter as *crebrifilata* and figures 14 and 14*a* that named *subcuspidata* by the same author. Figure 3 shows an extreme variant.

We have examined the following specimens:

U.S.N.M. cat. no.	No. of specimen.	Locality.	Collector.	Disposition of material.
32245	2	Monterey, California	Carpenter	U. S. Nat. Mus.
16267a	[a] 1	Santa Barbara, California	Col. Jewett	Do.
162637	1	Santa Barbara Islands, California		Do.
	6	Arch Beach, California		Univ. Cal.
151724	2	San Pedro, California	E. W. Roper	U. S. Nat. Mus.
152198	2	do	Mrs. Johnston	Do.
191547	7	do	F. L. Button	Do.
160480	1	do		Do.
196227	1	do	Mrs. Oldroyd	Do.
	428	do	do	Oldroyd coll.
196226	25	San Pedro (White's Point), California	do	U. S. Nat. Mus.
	1	do	do	Oldroyd coll.
206873	1	Off Catalina Island, California		U. S. Nat. Mus.
	1			Univ. Cal. coll.
	1	Pacific Beach, San Diego, California		Oldroyd coll.
192228	1	do	H. Hemphill	U. S. Nat. Mus.
122318	2	Ocean Beach, San Diego, California	F. W. Kelsey	Do.
153065	7	do	do	Do.
46504	3	San Diego, California	R. E. C. Stearns	Do.
	2	do	Delos Arnold	Univ. Cal. coll
	4	do		Do.
14829	[b] 1	do	J. G. Cooper	U. S. Nat. Mus.
	3	do	H. Hemphill	
60933	2	do	C. R. Orcutt	Do.
160481	5	do		Do.
206874	1	U. S. Bureau Fisheries station 3566 off San Diego, California. Three fathoms.		Do.
206875	1	San Diego, California		Do.
157204a	1	do		Do.
105585	1	Point Abreojos, Lower California	H. Hemphill	Do.
106510	2	do	do	Do.
32284	[c] 7	Todos Santos Bay, California	R. E. C. Stearns	Do.

[a] Figured.
[b] Figured type of *Turbonilla tenuicula subcuspidata*.
[c] Figured *crebrifilata*.

TURBONILLA (PYRGISCUS) VIRGO Carpenter.

Plate 8, figs. 4, 4*a*.

Chemnitzia virgo CARPENTER, Ann. Mag. Nat. Hist., 3d ser., vol. 15, 1865, p. 396.

Shell elongate-conic, milk-white. Nuclear whorls small, two, forming a depressed helicoid spire, the axis of which is almost at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls moderately rounded, slightly shouldered at the summit, weakly contracted at the periphery, ornamented by slender, sinuous protractive axial ribs, of which 24 occur upon the first and second, 22 upon the third, 20 upon the fourth to sixth, 22 upon the seventh and penultimate turn. Intercostal spaces about one and one-half times as wide as the ribs, well impressed, marked by six strongly impressed series of pits which extend up on the sides of the ribs but do not cross them; the peripheral and the third posterior to this are of equal strength and stronger than the rest. The space between the third and fourth above the perihery is a little wider than that between the others, which are about equally spaced. The space between the summit and the first spiral line below it is about equal to about double the space included between the other spirals. A finely incised line divides it into equal areas. Sutures strongly impressed, rendered wavy by the ribs. Periphery well rounded, marked by the feeble continuations of the axial ribs and a few distantly spaced spiral striations. Aperture oval; posterior angle obtuse; outer lip thin, columella moderately strong, sinuous and slightly reflected.

The type (Cat. no. 73993 U.S.N.M.) was collected by Dr. R. E. C. Stearns at Santa Barbara, California. It has nine post-nuclear whorls and measures: Length 4.8 mm., diameter 1.3 mm.

TURBONILLA (PYRGISCUS) MARSHALLI, new species.

Plate 8, figs. 8, 8*a*.

Shell very small, slender, light yellow, with a darker band immediately posterior to the periphery, and another slender one about halfway between the middle of the space between the sutures and the summit. Nuclear whorls depressed, helicoid, two and one-half, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fifth immersed. Post-nuclear whorls high between the sutures, flattened in the middle, gently rounded at the periphery and the summit, marked by slender, retractive axial ribs, of which 22 occur upon the first and second, 24 upon the third to fifth, 26 upon the sixth, and 24 upon the penultimate turn. Intercostal spaces a little wider than the ribs, moderately well impressed, marked by seven strong subequal series of pits between the periphery and the subsutural color band, and three fine incised lines posterior to this. Periphery of last whorl well rounded. Base moderately long, marked by the feeble continuations of the axial ribs and five subequal, equally spaced spiral striations. Aperture ovoid; posterior angle acute; outer lip thin, showing the external sculpture within; columella very oblique, curved, twisted, and slightly revolute.

The type and another specimen (Cat. no. 163262, U.S.N.M.) were dredged at U. S. Bureau of Fisheries station 2822, in 21 fathoms, off La Paz, Lower California. The type has eight post-nuclear whorls and measures: Length 3.6 mm., diameter 0.8 mm.

TURBONILLA (PYRGISCUS) CANFIELDI Dall and Bartsch.

Plate 9, figs. 3, 3*a*.

Turbonilla (*Pyrgiscus*) *canfieldi* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 504, 505, pl. 47, figs. 4, 4*a*.

Shell slender, elongate-conic, with the posterior half of the exposed portion of the whorls on the spire white and the anterior half chestnut brown, base white. Nuclear whorls two and two-thirds, large, smooth, forming a depressed helicoid spire whose axis is at right angles to the axis of the succeeding turn; not immersed and extending slightly beyond the outline of the spire on both sides. Post-nuclear whorls very slightly rounded, weakly roundly shouldered at the summit and very moderately contracted at the periphery, ornamented by very strong, broad, low, rounded, almost vertical axial ribs of which there are 22 upon the first, 24 upon the antepenultimate, and 28 upon the penultimate turn. These ribs extend prominently to the summit and crenulate the subchanneled sutures. Intercostal spaces narrow, not more than half the width of the ribs, crossed by 19 incised spiral lines which are of almost equal width and subequally spaced with the following exceptions, the seventh, eleventh, and the last three above the periphery are much wider, appearing as quadrangular pits in the intercostal spaces, the eleventh falling on about the middle of the exposed portion of the whorl on the spire, and the seventh about halfway between this and the summit. Periphery and base of the last whorl well rounded, the latter marked by the feeble continuations of the axial ribs which gradually disappear after crossing the periphery, and about 16 subequally spaced incised spiral lines. Aperture oval, somewhat effuse anteriorly, columella oblique, somewhat twisted, with a weak oblique fold a little anterior to its insertion.

The type (Cat. no. 196229, U.S.N.M.) was dredged by Mr. S. S. Berry in 12 fathoms off Del Monte, Monterey, California. It has 10 post-nuclear whorls and measures: Length 6.3 mm., diameter 1.2 mm.

TURBONILLA (PYRGISCUS) ALMO, new species.

Plate 9, figs. 8, 8*a*.

Shell slender, light brown, wax-yellow at tip. Nuclear whorls very small, two and one-half, planorboid, having their axis at right angles to that of the succeeding turns, in the first of which they are slightly immersed. First post-nuclear whorl almost smooth, the second with a mere indication of ribs, well rounded. The remaining post-nuclear whorls somewhat overhanging, appressed at the summit, well rounded, marked by moderately developed, rounded, retractive axial ribs, of which about 20 occur upon all but the penultimate whorl; upon this there are 22. Intercostal spaces a little wider than the ribs, marked by seven deep pits of unequal width and unequal spacing. Periphery of the last whorl marked by a broad plain band. Base well rounded, marked by the very feeble continuations of the axial ribs and nine irregular, wavy, incised spiral lines, the first two of which below the periphery are interrupted. Aperture ovate; posterior angle acute; outer lip thin, showing the external markings within; columella slender, very oblique, somewhat flexuose and revolute, with a slight fold at its insertion.

The type and three specimens (Cat. no. 162633, U.S.N.M.) were dredged in 2 fathoms off San Diego, California. The type has eight post-nuclear whorls and measures: Length 4.6 mm., diameter 1.2 mm.

TURBONILLA (PYRGISCUS) CALLIPEPLUM, new species.

Plate 9, figs. 11, 11*a*.

Shell elongate-conic, rather stout, milk-white. Nuclear whorls two, forming a planorboid spire, whose axis is at right angles to the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls flattened in the middle, with a strongly sloping shoulder which extends over the posterior fourth between the sutures, forming a decided angle at its anterior termination; slightly contracted at the suture, marked by slender, sinuous, slightly retractive, sublamellar, axial ribs, of which 14 occur upon the first two whorls, 16 upon the third and fourth, 18 upon the fifth, and 20 upon the remaining turns. Intercostal spaces varying somewhat in width, about four times as wide as the ribs, marked by a double series of narrow pits, one of which is at the periphery and the other at the anterior termination of the posterior third of the whorls. In addition to these pits there are finely incised lines of varying strength, 18 of which occur between the two pits and 9 between the posterior pit and the summit. Sutures well impressed. Periphery of the last whorl slightly angulated. Base marked by the feeble continuations of the axial ribs, which extend a little ways beyond the periphery, and 17 almost equal and almost equally spaced, slender, incised spiral lines. Aperture? (outer lip fractured); columella reflected.

The type (Cat. no. 122797, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2805 in 51 fathoms, on mud bottom, in Panama Bay. It has nine post-nuclear whorls and measures: Length 5.1 mm., diameter 1.4 mm.

TURBONILLA (PYRGISCUS) DINA, new species.

Plate 9, fig. 10.

Shell elongate-conic, milk-white. Nuclear whorls two and one-half, forming a depressed, helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Post-nuclear whorls slightly rounded on the anterior two-thirds between the sutures, posterior third forming a strong sloping shoulder, marked by narrow, lamellar ribs, of which 18 occur upon the first, 16 upon the second to seventh, and 18 upon the eighth and penultimate turn. Intercostal spaces about four times as wide as the ribs, marked by a double series of pits, one of which is at the periphery and the other at the angle of the shoulder. The space between the two pits is crossed by nine equal and equally spaced spiral striations, the space between the summit and the submedian pit is marked by twelve incised spiral lines of which those near the summit are finer and closer spaced than the rest. Sutures strongly impressed. Periphery of the last whorl slightly angulated. Base short, well rounded, marked by about twenty equal and almost equally spaced spiral striations. Aperture rhomboidal; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, almost straight and somewhat revolute.

The type and another specimen (Cat. no. 162428, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2799, in Panama Bay, in 29½ fathoms. It has nine post-nuclear whorls and measures: Length 5.2 mm., diameter 1.5 mm.

TURBONILLA (PYRGISCUS) SHIMEKI, new species.

Plate 9, figs. 4, 4*a*.

Shell elongate-conic, with a very large nucleus which extends beyond the outline of its post-nuclear spire; bluish-white with four rather broad, pale yellow bands, one of which is immediately below the summit and another at the periphery, a third halfway between the two, while the fourth is on the middle of the base. Nuclear whorls one and one-half, planorboid, having their axis at right angles to that of the succeeding turns, upon the first of which it rests. Post-nuclear whorls somewhat overhanging, appressed and slightly exserted at the summit, well rounded, the greatest convexity falling on the anterior third between the sutures, marked by broad, low, rounded, slightly retractive axial ribs on all but the first two whorls, which are smooth. Of these ribs, 14 occur upon the third to sixth, 16 upon all the remaining whorls excepting the penultimate, which has 18. Intercostal spaces shallow, almost twice as wide as the ribs, marked by nineteen series of incised spiral pits, of which the peripheral and the sixth below the summit are a little stronger than the rest. Sutures well impressed. Periphery and base of the last whorl well rounded, marked by the continuations of the axial ribs and spiral lines like those between the sutures. Aperture moderately large, oval; posterior angle acute; outer lip thin, showing the external markings within; columella slender, flexuose, and slightly revolute.

The type and one other specimen (Cat. no. 206877, U.S.N.M.) were dredged by the U. S. Bureau of Fisheries at station 2813, in 40 fathoms, on coral sand bottom, off the Galapagos Islands, South America. It has ten post-nuclear whorls and measures: Length 5.6 mm., diameter 1.2 mm.

Named for Prof. B. Shimek.

TURBONILLA (PYRGISCUS) SANCTORUM, new species.

Plate 9, figs. 2, 2*a*.

Shell elongate-conic, milk-white. Nuclear whorls two and one-fourth, forming a depressed, helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls very strongly rounded, appressed at the summits, contracted at the periphery, marked by strong sublamellar, slightly protractive axial ribs, of which 16 occur upon the first to eighth, 18 upon the ninth, and 20 upon the penultimate turn. Intercostal spaces about four times as wide as the ribs, marked by two series of broad spiral pits, one of which is at the periphery, the other a little posterior to the middle of the space between the sutures. In addition to these pits there are fine, almost equal, incised spiral lines, of which eight occur between the peripheral and median pits and ten between the median and the summit. Sutures strongly constricted. Periphery marked by a narrow plain band. Base well rounded, marked by the feeble continuations of the axial ribs and fourteen equal, fine wavy, incised spiral lines. Aperture subquadrate; posterior angle obtuse; outer lip thin, showing the external markings within; columella very oblique, almost straight, reflected.

The type and twenty specimens (Cat. no. 162514, U.S.N.M.) were dredged at U. S. Bureau of Fisheries station 2823, off La Paz, in 26½ fathoms, off Lower California. The type has ten post-nuclear whorls and measures: Length 5.8 mm., diameter 1.3 mm. Cat. no. 162516, U.S.N.M., contains four specimens dredged at U. S. Bureau of Fisheries station 2827, off Ceralvo Island, Gulf of California, in 10 fathoms, off Lower California.

TURBONILLA (PYRGISCUS) EUCOSMOBASIS Dall and Bartsch.

Plate 10, figs. 11, 11*a*.

Turbonilla (*Pyrgiscus*) *eucosmobasis* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 507–508, pl. 45, figs. 8, 8*a*.

Shell quite large, of very regular outline, creamy white. Nucleus rather small, composed of two and one-half whorls, helicoid with much depressed spire, somewhat obliquely about one-third immersed in the first of the succeeding turns, the axis of the nuclear spire being almost at a right angle to the axis of the later whorls. Post-nuclear whorls moderately rounded, widest a little above the suture, sloping gently toward the summit and more abruptly toward the base, ornamented by moderately strong, rounded, somewhat flexuous, axial ribs, of which about 18 appear upon the second, 20 upon the seventh, 22 upon the eighth, and 27 upon the penultimate whorl. Intercostal spaces only moderately deep, a little wider than the ribs, marked by 6 strong incised spiral lines which extend up on the sides of the ribs and frequently pass over their summits; the uppermost or posterior one of these incised lines is least pronounced, the second one above the suture, and the third one about half again as far apart as the remaining, which are equally spaced. In addition to these the shell is marked by many faint wavy spiral striations between the deep ones. Sutures plain, well defined. Base of the last whorl very short, well rounded, marked by the faint continuations of the axial ribs and about 15 well defined more or less equally spaced deep spiral striations with fainter ones between them as on the exposed portion of the whorls of the spire; the first deep basal spiral striation and the one above the suture are some little distance apart and mark a plain band excepting the fainter sculpture. Aperture quite large, subquadrate; columella short, somewhat twisted, revolute.

The type (Cat. no. 162679, U.S.N.M.) was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 2902, off Santa Barbara, California, in 53 fathoms. It has 12 post-nuclear whorls which measure: Length 11.2 mm., diameter 2.8 mm.

Another specimen (Cat. no. 162680, U.S.N.M.) was dredged at station 3195, in 252 fathoms, on green mud, bottom temperature 43°.2, in San Luis Obispo Bay, California. Four specimens (Cat. no. 162681)were dredged at station 2901, on gray sand and mud bottom, at a depth of 48 fathoms, temperature 55°.1, off Santa Rosa Island. The University of California has two lots, one specimen dredged at station 32, off Catalina Island, and two from station 59, off San Diego, California.

TURBONILLA (PYRGISCUS) HALIDOMA, new species.

Plate 9, figs. 6, 6*a*.

Shell elongate-conic, milk-white. Nuclear whorls small, two and one-fourth, forming a moderately elevated spire whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls flattened in the middle, with a sloping shoulder that extends over the posterior fourth between the sutures and renders the whorls slightly angulated at their anterior margin; weakly contracted at the suture, marked by moderately strong, well rounded, low, retractive axial ribs, of which 24 occur upon the first, 26 upon the second and third, and 24 upon the remaining turns. Intercostal spaces a little more than double the width of the ribs, marked by pits and incised spiral lines. Of these the one at the periphery and the one at the anterior termination of the posterior third between the sutures are of equal width, and much wider than the rest; two other pits a little less strong divide the space between the two strong pits into three segments, the middle one of which is a trifle wider than the other two which are equal. The three areas are again divided by finer lines, the first above the periphery being crossed by one, the next by three and the third by two fine striations. The space between the summit and the deep series of pits anterior to it is crossed by four incised and wavy, exceedingly fine spiral lines. Periphery of the last whorl well rounded, marked by the feeble extensions of the axial ribs which disappear shortly after crossing it. Base well rounded, marked by twenty-two well incised subequal and subequally spaced spiral lines. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, twisted and slightly revolute.

The type (Cat. no. 162693, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2822 in 21 fathoms, off La Paz, Lower California. It has nine post-nuclear whorls and measures: Length 6.7 mm., diameter 1.8 mm.

TURBONILLA (PYRGISCUS) AURICOMA Dall and Bartsch.

Plate 9, figs. 5, 5*a*.

Turbonilla (*Pyrgiscus*) *auricoma* Dall and Bartsch, Mem. Cal. Acad. Sci., vol. 3, 1903, pp. 274, 275, pl. 1, figs. 4, 4*a*.

Shell slender, attenuated, brown, lighter on the early whorls, becoming dark on the last. Nuclear whorls two and one-half, large, helicoid, not immersed, projecting somewhat beyond the outline of the spire, their axis being at a right angle to the axis of the later whorls; post-nuclear whorls at first somewhat rounded, later flattened, marked by well-developed, rather strong, retractive axial ribs, of which 16 appear upon the third and fourth, 18 upon the fifth to eighth, 20 upon the ninth, 22 upon the tenth, and 30 upon the penultimate turn. Intercostal spaces a little wider than the ribs on all but the penultimate whorl; on this they are somewhat narrower, crossed between the sutures by nine subequally spaced, almost equally strong, spiral lines of pits, which pass up on the sides of the ribs but do not cross their summit. Periphery and base of last whorl inflated, well rounded, marked by the continuations of the axial ribs, which extend almost undiminished to the umbilical area and eight equally strong and almost equally spaced, well-incised spiral lines. Aperture ovate; posterior angle acute; outer lip thin, showing the external sculpture within, the spiral markings appearing as red threads; columella slender, rounded, reflected, the reflection giving the base an umbilicated appearance; the parietal wall covered by a strong callus.

The type and three specimens (Cat. no. 106511, U.S.N.M.) were collected at Scammon Lagoon, Lower California. The type has 12 post-nuclear whorls and measures: Length 7.2 mm., diameter 1.9 mm. Cat. no. 73997, U.S.N.M., contains a specimen from San Diego. Three have been determined for Mrs. Oldroyd from San Pedro and two for Doctor Arnold from Scammon Lagoon.

TURBONILLA (PYRGISCUS) CASTANEA Keep.

Plate 9, figs. 1, 1*a*.

Chemnitzia castanea (Carpenter,) Keep, West Coast Shells, 1888, p. 52, fig. 33.

Shell elongate-conic, chestnut brown. Nuclear whorls very small, two and one-half, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are about one-fourth immersed. Post-nuclear whorls flattened in the middle, slightly excurved at the summit, where they are faintly shouldered and somewhat contracted at the periphery, marked by rather irregular, strong, low, rounded, retractive axial ribs; of which 20 occur on the third, 22 on the fourth, 24 on the fifth to seventh, 26 on the eighth, 28 on the ninth, and about 50 upon the penultimate whorl; upon this they are very irregular. Intercostal spaces less wide than the ribs, shallow, marked by a series of spiral pits, which vary in width and number on the various whorls; on the early ones there are eight, on the ninth there are twelve, while on the penultimate there are sixteen between the peripheral series and the summit. Sutures well marked. Periphery and base of last whorl inflated, marked by the continuations of the axial ribs, which extend almost undiminished to the umbilical area; and about twenty subequal and subequally spaced incised spiral lines. Aperture pear-shaped; posterior angle acute; outer lip thin, showing the external sculpture within; chestnut brown; columella slender, strongly curved, and slightly revolute; parietal wall covered by a thick callus.

The specimen described and figured (Cat. no. 160224, U.S.N.M.) was collected by Mrs. Oldroyd at San Pedro, California. It has eleven post-nuclear whorls and measures: Length 10.5 mm., diameter 2.5 mm. Professor Keep's types which we have had for examination came from San Diego.

The following specimens have been examined:

U.S.N.M. cat. no.	No. of specimens.	U. S. B. F. station.	Locality.	Depth, fathoms.	Disposition of material.
160224	1	....	San Pedro, California	....	U. S. Nat. Mus.
162682	1	3566	San Diego, California	3	Do.
163264	1	3573	.....do	1.5	Do.
	2	....	.....do	....	D. Arnold coll.

TURBONILLA (PYRGISCUS) CASTANELLA Dall.

Plate 9, fig. 7.

Turbonilla (*Pyrgiscus*) *castanella* Dall, Nautilus, vol. 22, 1908, p. 131. = *Turbonilla* (*Pyrgiscus*) *castanea* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 509, 510, pl. 47, fig. 7; not *Chemnitzia castanea* Keep, West Coast shells, 1888, p. 5, fig. 33.

Shell very large, stout and heavy, chestnut brown. Nuclear whorls decollated. Post-nuclear whorls well rounded, ornamented by many broad, flattened, more or less regular and evenly placed retractive axial ribs, of which about 22 appear upon the third, 26 upon the fifth, and 40 upon the seventh whorl. On the penultimate and antepenultimate whorls they are more or less irregular in form, number, and spacing. Intercostal spaces much narrower than the ribs. The spiral sculpture consists of eight deep, quite regularly spaced lines of pits, which are very pronounced in the intercostal spaces and on the sides of the ribs, but do not appear to cross their summits except on the penultimate and the last whorl. Sutures well defined, simple. Periphery and base of the last whorl evenly rounded, the latter ornamented by the prolongation of the axial ribs and quite a number of continuous well-impressed spiral lines with faint spiral striation between them. Aperture suboval, somewhat effuse anteriorly, posterior angle obtuse (outer lip fractured, very thick); columella strong, slightly curved, and strongly revolute, with a weak, very oblique internal fold near its insertion; parietal wall and umbilical region covered by a weak callus. Columella and extreme anterior portion of the aperture white.

The type (Cat. no. 74000, U.S.N.M.) belongs to the Stearns collection and was obtained at Monterey, California. It has 10 post-nuclear whorls (the nucleus and perhaps the first three being lost), and measures: Length 13.5 mm., diameter 3.7 mm.

This species is remarkable for being the largest known member of the section *Pyrgiscus* on the west coast of America.

TURBONILLA (PYRGISCUS) INDENTATA Carpenter.

Plate 10, fig. 10.

Chrysallida indentata Carpenter, Cat. Mazatlan Shells, 1856, p. 425–426.

Shell elongate-conic, wax yellow. Nuclear whorls two, forming a subglobose, helicoid spire, whose axis is almost at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls moderately rounded, slightly contracted at the sutures, subtabulatedly shouldered at the summit, marked by strong, slightly protractive, axial ribs, of which 14 occur upon the first, 16 upon the second, 18 upon the third and fourth, 20 upon the fifth and sixth, and 22 upon the penultimate turn. Intercostal spaces as wide as the ribs, crossed by subequal, irregularly spaced, raised threads, the posterior one of which forms quite a cord at the summit of the whorls; this is followed by a rather wide pit; then two closely spaced, raised threads; another pit equal to the first; then six very fine closely spaced threads; a third pit equal to the others; two strong threads, followed by a peripheral pit. Periphery of the last whorl well rounded. Base rather prolonged, well rounded, marked by the continuation of the axial ribs, which extend to the umbilical area and eight spiral threads. Aperture oval; posterior angle acute; outer lip thin; columella slightly curved; parietal wall covered by a faint callus.

Two specimens were obtained off *Spondylus*, at Mazatlan, Mexico, one a young individual, the other an adult; the latter is on tablet 1986, Liverpool collection, British Museum. It has eight post-nuclear whorls, and measures: Length 3.8 mm., diameter 1.2 mm.

TURBONILLA (PYRGISCUS) CORA D'Orbigny.

Chemnitzia cora D'ORBIGNY, Voy. Am. Mérid., vol. 5, 1847, p. 398, pl. 76, figs. 7–9.

"Shell elongate-conic, thick, ornamented longitudinally by very deep folds, between which are fine, regular spiral striations, among which four are deeper, three of which reproduce themselves in very regular manner on all the whorls. Nucleus very large, oblong; spire elongate-conic, composed of eight flattened whorls which are separated by a very marked suture; aperture oval; lip thin; color white. Long. 5 mm., diam. 1.5 mm."

To the above diagnosis he adds: "Ornamented with ribs and transverse striæ, like *C. ornata*, this is larger in proportion, and is remarkable in that four of the striæ are more profoundly traced than the others and reproduce themselves on all the whorls of the spire."

It inhabits the coast of Peru near Payta. We have not seen any specimens belonging to this species, and have translated the above from the original description by D' Orbigny.

The figures referred to do not depict the specimen described. They represent a short, stout individual having *six* post-nuclear whorls of a light brown color, with about 12 strong axial ribs on the first, 18 on the fourth, and 20 on the penultimate whorl; and instead of four (three between the sutures) spiral lines the figure shows seven between the sutures and about an equal number on the base. D'Orbigny carefully points out that *C. cora* has only three strong spiral lines visible between the sutures, and compares it with *C. ornata*. We therefore are inclined to believe that some mistake has been made in the figures. The wrong specimen may have been figured or the artist may have figured *C. cora* wrongly.

TURBONILLA (PYRGISCUS) CRATICULATA Mörch.

Plate 10, figs. 1, *1a*.

Turbonilla craticulata Mörch, Malak. Blätt., vol. 6, 1859, p. 119.

Shell elongate-conic, brown. Nuclear whorls one and one-third, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Post-nuclear whorls moderately rounded, slightly contracted at the periphery, and weakly shouldered at the summit; marked by moderately strong, straight, very regular, almost vertical axial ribs, of which 14 occur upon the first to third, 16 upon the third to sixth, 18 upon the seventh to ninth, and 22 upon the penultimate turn. Intercostal spaces a little wider than the ribs, marked by seven series of pits, which are a little wider than the raised spaces that separate them. The third of these pits anterior to the summit is a little stronger than the rest; the remainder are of equal strength and spacing. Sutures well impressed. Periphery and base of the last whorl well rounded, marked by the feeble continuations of the axial ribs. The base is marked by incised spiral lines, the first two anterior to the periphery being similar in character to those between the sutures; the rest are successively finer from the periphery to the umbilical region. Aperture ovate, somewhat effuse anteriorly, posterior angle acute; outer lip thin, showing the external sculpture within; columella oblique, slightly curved, and very strongly revolute, provided with a strong oblique fold a little anterior to its insertion; parietal wall covered by a thin callus.

Three specimens were dredged by Dr. A. S. Oersted in 30 fathoms at Los Bocorones, a small island near Punta Arenas, Costa Rica. This is Doctor Mörch's type lot in the museum in Copenhagen, Denmark. Our description and figure are taken from the most perfect specimen, which has eleven post-nuclear whorls, and measures: Length 7.8 mm., diameter 2. mm.

TURBONILLA (PYRGISCUS) CERALVA, new species.

Plate 10, figs. 5, *5a*.

Shell small, slender, milk-white. Nuclear whorls one and three-fourths, depressed, helicoid, having their axis at right angles to that of the succeeding turns, not immersed. Post-nuclear whorls very high between the sutures, moderately rounded, very slightly shouldered at the summit, and somewhat contracted at the sutures, marked by slender, curved, rounded, decidedly retractive axial ribs, which are very feebly expressed on the first whorl, on all the rest excepting the penultimate, which has 40, there are 36. Intercostal spaces about as wide as the ribs, marked by seven equal and equally spaced spiral pits. Periphery and base of the last whorl well rounded, the latter marked by the continuations of the axial ribs and eight equally spaced series of spiral pits, of which those nearest the umbilicus are a little less strongly developed than the rest. Aperture moderately large, oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, decidedly curved, and somewhat twisted.

The type (Cat. no. 162685, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2823, off La Paz, in 26½ fathoms. It has seven post-nuclear whorls and measures: Length 3.7 mm., diameter 0.8 mm. Another specimen (Cat. no. 206878, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2826, off Ceralvo Island, Gulf of California, in 9½ fathoms.

TURBONILLA (PYRGISCUS) LEPTA, new species.

Plate 10, figs. 7, *7a*.

Shell elongate-conic, very slender, milk-white. Nuclear whorls one and three-fourths, depressed, helicoid, having their axis at right angles to that of the succeeding turns, in the first of which they are very slightly immersed. Post-nuclear whorls slightly rounded, marked by well-developed, straight, rounded, strongly retractive axial ribs, of which there are 20 upon the first, 18 upon the second to sixth, and 20 upon the penultimate turn. Intercostal spaces about as wide as the ribs, marked by eight equal and equally spaced incised spiral lines. Sutures well impressed. Periphery and base of the last whorl well rounded, marked by the continuations of the axial ribs and five equal and equally spaced incised spiral lines. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, curved, and slightly revolute.

The type (Cat. no. 162584, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2823 in 26½ fathoms, off La Paz, Lower California. It has eight post-nuclear whorls and measures: Length 2.7 mm., diameter 0.7 mm.

TURBONILLA (PYRGISCUS) HISTIAS, new species.

Plate 10, figs. 8, *8a*.

Shell elongate-conic, slender, posterior half between the sutures, light yellow; anterior half of base, chestnut. Nuclear whorls two, forming a depressed, helicoid spire, the axis of which is at right angles to that of the succeeding turns, upon the first of which it rests. Post-nuclear whorls slightly overhanging, flattened in the middle, very slightly shouldered at the summit, quite strongly contracted at the suture, marked by strong, somewhat sinuous, narrow, retractive axial ribs, of which 18 occur upon all but the penultimate turn, which has 24. Intercostal spaces about two times as wide as the ribs upon all but the last turn, upon which they are a little narrower, marked by eight equal and equally spaced spiral series of pits on all but the last two whorls; on these the third and fourth posterior to the periphery split into finer lines. Sutures well impressed. Periphery and base of the last whorl well rounded, marked by the axial ribs which extend undiminished to the umbilical area, and twelve incised spiral lines, of which those immediately below the periphery are the stronger. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, slightly twisted, decidedly curved, and somewhat revolute; parietal wall covered with a strong callus.

The type and two specimens (Cat. no. 162636, U.S.N.M.) were dredged at U. S. Bureau of Fisheries station 2822, off La Paz, in 21 fathoms, on sand bottom off Lower California. The type has ten post-nuclear whorls and measures: Length 4.8 mm., diameter 1.1 mm.

TURBONILLA (PYRGISCUS) SUBULA Mörch.

Plate 10, fig. 3.

Turbonilla subula MÖRCH, Malak. Blätt., 1859, vol. 6, p. 120.

Shell of medium size, white. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, moderately contracted at the suture, and slightly shouldered at the summit; ornamented by strong, somewhat flexuose, narrow, and slightly retractive axial ribs, of which about 16 occur upon the first of the remaining whorls, 18 upon the second and third, 20 upon the fourth to sixth, and 24 upon the penultimate turn. Intercostal spaces about as wide as the ribs, marked by nine subequal and subequally spaced incised spiral lines, which pass up on the sides of the ribs, but do not cross their summits. Sutures well impressed. Periphery and base of the last whorl well rounded, marked by the continuations of the axial ribs, which extend to the umbilicus. The base has in addition a series of spiral striations, the first of which below the periphery is interrupted like those are between the sutures, separated by a little greater distance from the first one posterior to the periphery than that is from its neighbor posterior to it; the remaining are more or less continuous, less strong, wavy, and more closely spaced. Aperture suboval; posterior angle acute; outer lip thin; columella twisted and revolute; parietal wall covered with a thin callus.

The specimen described and figured is Doctor Mörch's type and is in the collection of the Copenhagen Museum. It was collected by Dr. A. S. Oersted at Los Bocorones, a small island near Punta Arenas, Costa Rica, in 30 fathoms. It has lost the early whorls; the last eight only remain, which measure: Length 4.9 mm., diameter 1.3 mm.

TURBONILLA (PYRGISCUS) WICKHAMI, new species.

Plate 10, fig. 9.

Shell elongate-conic, milk-white. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, contracted at the sutures, with a moderately broad, sloping shoulder at the summit marked by well-developed, rounded, very regular, slightly protractive axial ribs, of which 20 occur upon the second and 22 upon the remaining, excepting the penultimate whorl, which has 32. Intercostal spaces a little wider than the ribs, marked by seven series of spiral pits, of which the third below the summit is almost twice as wide as the rest. Sutures moderately constricted. Periphery of the last whorl well rounded. Base short, well rounded, marked by the continuations of the axial ribs, which extend to the umbilical area, and 11 incised spiral lines, of which those immediately below the periphery are somewhat interrupted and wider than the rest. Aperture rhomboidal; posterior angle acute; columella rather stout, revolute.

The type (Cat. no. 206879, U.S.N.M.) and three specimens were dredged by the University of California at station 32, off Santa Catalina Island, California. It has 10 post-nuclear whorls and measures: Length 8 mm., diameter, 2.1 mm.

Named for Prof. H. F. Wickham.

TURBONILLA (PYRGISCUS) LARA, new species.

Plate 10, figs. 6, *6a*, *6b*.

Shell small, slender, milk-white. Nuclear whorls two and one-fourth, forming a depressed, helicoid spire, having its axis at right angles to that of the succeeding turns, in the first of which it is very slightly immersed. Post-nuclear whorls flattened in the middle, rounding slightly toward the moderately shouldered summit, somewhat contracted at the suture, marked by fairly strong, straight, slightly retractive axial ribs, of which 18 occur upon the first and second and 20 upon all the remaining whorls excepting the penultimate turn, which has 22. Intercostal spaces varying from one and one-half to two times the width of the ribs, marked by nine series of spiral pits, of which the peripheral and the fifth above the periphery are the widest; the third and fourth above the periphery and the two immediately below the summit are a little narrower than the rest. The segments left between the pits form almost equal raised cords. Sutures well marked. Periphery of the last whorl and base moderately well rounded, ornamented by the continuations of the axial ribs and three strong, interrupted lines of pits on the posterior half and five slender lines on the anterior. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, curved, and slightly revolute. Parietal wall covered by a thin callus.

The type (Cat. no. 96707, U.S.N.M.) and sixty-six specimens were dredged at U. S. Bureau of Fisheries station 2823, off La Paz, in 27 fathoms. It has nine post-nuclear whorls and measures: Length 4.3 mm., diameter 2 mm.

The following specimens have been examined:

U.S.N.M. cat. No.	No. of specimens.	U. S. B. F. station.	Locality.	Depth, fathoms.	Disposition of material.
96707	66	2823	Off La Paz, Gulf of California	27	U. S. Nat. Mus.
162683	8	2822	....do	21	Do.
191564	5	2826–2828	Off Ceralvo Island, Gulf of California.	$9\frac{1}{2}$–10	Do.
151929	31	2826–2828	....do	$9\frac{1}{2}$–10	Do.

TURBONILLA (PYRGISCUS) CINCTELLA Mörch.

Plate 10, figs. 2, *2a*, *2b*.

Turbonilla cinctella Mörch, Malak. Blätt., vol. 6, 1859, p. 119.

Shell broadly elongate-conic, milk-white, with a faint broad yellowish band on the middle of the space between the sutures, a second narrow one at the periphery, a third at the insertion of the columella. Nuclear whorls two and one-half, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls extremely regular, well rounded, appressed at the summit, somewhat contracted at the suture, marked by slender, somewhat sinuous, almost vertical axial ribs, of which 20 occur upon the first and second, 22 upon the third, 24 upon the fourth and fifth, and 26 upon the remaining turns. Intercostal spaces twice as wide as the ribs, marked by a series of moderately strong pits at the periphery and a second about half as broad, a little posterior to the middle of the whorls. In addition to these pits the intercostal spaces are marked by 28 slender, equally spaced and equally strong, incised spiral lines, 16 of which occur between the periphery and the median pit, and 12 between this and the summit. Sutures well impressed. Periphery and base of the last whorl well rounded, the latter marked by the continuation of the axial ribs, which extend feebly to the umbilical area, and slender spiral striations, which are stronger and more distantly spaced than those on the spire, growing successively weaker from the periphery to the columella. Aperture oval; posterior angle acute; out lip thin, showing the external markings within; columella almost straight, slightly revolute.

The type which has served us for our description and figure has nine post-nuclear whorls and measures: Length 5 mm. diameter 1.6 mm. It was collected by Dr. A. S. Oersted at Sonsonate, Guatemala, and is in the museum in Copenhagen, Denmark.

TURBONILLA (PYRGISCUS) ADUSTA, new species.

Plate 10, figs. 12, *12a*.

Shell robust, pale brown. (Nuclear whorls decollated.) Post-nuclear whorls flattened, slightly exerted at the summit, where they are moderately squarely shouldered, marked by well developed, rounded, slightly retractive, axial ribs, of which 20 occur upon the second and third, 22 upon the fourth and fifth, 24 upon the sixth of the remaining turns, and 28 upon the penultimate whorl. Intercostal spaces equaling the ribs, crossed by a double series of spiral pits, five are strong and of equal strength, one of which is at the periphery, the other a little posterior to it, the third occupies the middle of the space between the sutures, while the other two divide the space posterior to this into three equal areas. The fine lines are arranged in the following manner: Between the second and third supra-peripheral pit, two fine lines; between the third and fourth, one; between the fourth and fifth, one; between the fifth and summit, two. Sutures well impressed, rendered sinuous by the ribs. Periphery of the last whorl marked by a broad band, crossed by the extensions of the axial ribs, which continue feebly over the well-rounded base to the umbilical area. In addition to these ribs, the base is marked by eleven incised spiral lines, the three immediately below the periphery being somewhat interrupted, the remaining are equal and equally spaced. Aperture ovate; posterior angle acute; columella slender, somewhat curved and reflected.

The type (Cat. no. 206880, U.S.N.M.) was collected at San Diego, California. It has lost the nucleus and probably the first post-nuclear whorl. The eight remaining measure: Length 5.7 mm., diameter 1.7 mm.

TURBONILLA (PYRGISCUS) LARUNDA, new species.

Plate 10, figs. 4, *4a*, *4b*.

Shell elongate-conic, milk-white, with a broad yellow band a little anterior to the middle of the whorls between the sutures. Nuclear whorls two, forming a depressed helicoid spire, which has its axis at right angles to that of the succeeding turns, upon the first of which it rests, but is not immersed. Post-nuclear whorls flattened in the middle, rounded at the summit, quite strongly contracted at the suture, ornamented by narrow, sinuous, well developed, retractive axial ribs, of which 16 occur upon the first to seventh, 18 upon the eighth to ninth, and 20 upon the penultimate turn. Intercostal spaces about three times as wide as the ribs, marked by eleven incised spiral lines, of which the three immediately below the summit and the one between the third and fourth above the periphery are finer than the rest, and the fourth and fifth below the summit and the peripheral one are of about equal width, and considerably stronger than the intervening four, which are subequal. Periphery of the last whorl well rounded. Base moderately long, well rounded, marked by the continuations of the axial ribs and seven strongly incised subequally spaced spiral lines, of which the three immediately below the periphery are somewhat interrupted and stronger than the rest.

Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender and somewhat sinuous.

The above description is based upon two cotypes which, together with a third specimen, were obtained at U.S. Bureau of Fisheries station 2822 in 21 fathoms, off La Paz, Lower California. They are entered as Cat. no. 206881, U.S.N.M. One of the two cotypes has the nucleus and nine post-nuclear whorls and measures: Length 3.6 mm., diameter 0.8 mm.; the other has lost the nucleus and probably the first four post-nuclear whorls, the seven remaining measure: Length 4.3 mm., diameter 1.2 mm.

Subgenus **MORMULA** A. Adams.

Mormula A. ADAMS, Journ. Linn. Soc. London, vol. 7, 1864, p. 1;+*Pyrgostylus* MONTEROSATO, Il. Nat. Hist. Sicil., 1884, p. 90. Type, *Turbo striatulus* Linnæus.

Turbonillas having axial ribs and deeply incised spiral lines; also irregularly disposed varices on the outer surface, which usually mark internal lirations on the outer lip, or internal lirations of the outer lip only. Sculpture never nodulose.

Type.—*Mormula rissoina* A. Adams.

KEY TO THE SPECIES OF THE SUBGENUS MORMULA.

- Varices present on the outside of the whorls.
  - Adult shell more than 16 mm. long.
    - Shell conspicuously banded .... *lordi*, p. 111.
    - Shell not conspicuously banded.
      - Strongly incised lines between sutures 6, axial ribs 18–40... *regina*, p. 112.
      - Strongly incised lines between sutures 9, axial ribs 16–28. *catalinensis*, p. 113.
      - Strongly incised lines between sutures 12, axial ribs 16–26. *eschscholtzi*, p. 113.
  - Adult shell less than 13 mm. long.
    - Shell brown.
      - Strongly incised lines between sutures 5, axial ribs 16–24. *tridentata*, p. 114.
      - Strongly incised lines between sutures 10, axial ribs 16–22. *ambusta*, p. 115.
    - Shell white.
      - Shell large, adult more than 9 mm. long .... *major*, p. 116.
      - Shell small, adult less than 4 mm. long .... *santosana*, p. 117.
- Varices absent on the outside of the shell.
  - Spiral sculpture strong.
    - Shell brown.
      - Adult shell more than 8 mm. long .... *pentalopha*, p. 117.
      - Adult shell less than 6 mm. long .... *heterolopha*, p. 118.
    - Shell white .... *ignacia*, p. 119.
  - Spiral sculpture absent or microscopic.
    - Whorls shouldered .... *periscelida*, p. 119.
    - Whorls not shouldered .... *phalera*, p. 120.

TURBONILLA (MORMULA) LORDI E. A. Smith.

Plate 11, figs. 4, 4*a*.

Chemnitzia lordi E. A. Smith, Ann. Mag. Nat. Hist., vol. 6, 1880, p. 288. *Turbonilla* (*Mormula*) *lordi* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 510, 511, pl. 45, figs. 7, 7*a*.

Shell very large, light brown to pale yellowish-white, variously banded. Nuclear whorls two, smooth, helicoid, moderately elevated, having their axis at right angles to the axis of the succeeding turns and about one-fourth immersed in the first of them. Post-nuclear whorls well rounded, ornamented by heavy, broad, low axial ribs, of which about 14 occur upon the second, 16 upon the eighth, 22 upon the eleventh, and 30 upon the penultimate whorl. Intercostal spaces not deeply depressed, about as wide as the ribs, ornamented by about 12 to 15 irregularly spaced spiral striations between the sutures; those near the summit of the whorls are closer and more feeble than those near the periphery of the whorls. Sutures strongly impressed, somewhat wavy. Periphery of the last whorl somewhat angulated in young specimens, moderately well rounded in adults. Base rather short, marked by faint continuations of the axial ribs and faint wavy spiral striation. Aperture subrhombic, posterior angle obtuse, outer lip thin, showing the external sculpture and banding within; columella stout, slightly twisted and revolute, provided with an oblique internal fold. The color markings in the specimen here described and figured consist of a pale yellowish-brown band, about a quarter of the width of the whorl between the sutures, covering the posterior part, followed by a narrow band of the yellowish-white ground color, which is followed by a band of brown a little darker than the first and about as wide as the last-named white band; then a broad pale white band, lastly a narrow pale yellow one above the periphery finishes the marking between the sutures. The periphery is marked by a narrow band of white followed by a deep brown one which shades gradually to the white about the umbilical region.

The characters which ally this species to *Mormula* are only feebly developed, now and then two ribs become fused and suggest a varix; the internal lirations, too, are only very feebly expressed and appear in the aperture of only one specimen. The specimen figured has 14 post-nuclear whorls and measures: Length 20.8 mm., diameter 5.1 mm. It was collected in 12 fathoms at Sitka Harbor, Alaska, and is Cat. no. 160492, U.S.N.M. No. 160069, U.S.N.M., contains 7 individuals from the same locality; no. 133234, U.S.N.M., has 2 from Port Orchard, Washington, and no. 4480, U.S.N.M., 1 from Puget Sound, Washington. Seven specimens were collected by Rev. G. W. Taylor at Banks Island, British Columbia. One of these, a young individual

(Cat. no. 196234, U.S.N.M.), has furnished the description of the nucleus. It has 9 post-nuclear whorls and measures: Length 5.2 mm., diameter 2.1 mm.

This is the largest species of this group known from the west coast of America.

TURBONILLA (MORMULA) REGINA, new species.

Plate 11, fig. 1.

Shell very large, elongate-conic, slender, pale chestnut. (Nuclear whorls decollated.) Post-nuclear whorls well rounded, appressed at the summit, moderately constricted at the periphery, marked at irregular intervals by strong varices and by very regularly narrow, low, rounded, slightly protractive axial ribs, of which 16 occur upon the first and second, 18 upon the third, 22 upon the fourth, 24 upon the fifth to seventh, 30 upon the eighth and ninth, 36 on the tenth, 40 on the eleventh and the penultimate whorl. Intercostal spaces about one and one-half times as wide as the ribs, marked by 6 well incised spiral lines, which extend strongly upon the sides of the ribs and weakly over them; the space between these lines is marked by numerous exceedingly fine, spiral striations. Sutures constricted. Periphery of the last whorl slightly angulated, marked by an incised spiral line. Base short, well rounded, marked by the feeble continuations of the axial ribs and numerous very fine, closely spaced, wavy, spiral striations. Aperture rhomboidal; posterior angle obtuse; columella strong, almost straight, decidedly revolute.

The type (Cat. no. 162686, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2902 in 15 fathoms, temperature 45°, off Santa Rosa Island, California. It has 13 post-nuclear whorls, having lost the nucleus and probably the first post-nuclear whorl, and measures: Length 19.6 mm., diameter 5 mm.

We have examined the following specimens:

U.S.N.M. cat. no.	No. of specimens.	U.S.B.F. station.	Locality.	Depth, fathoms.	Temperature, degrees.	Disposition of material.
162686......	1	2902.......	Santa Rosa Island, California.	15	45	U. S. Nat. Mus.
162687......	1	2901.......	.....do.....................	48	55.1	Do.
160119......	1	....	Catalina Island, California.	....	....	Do.
	1	14 [a].......	Off Point Fermin, California.	....	....	Univ. Cal. coll.
	1	21 [a] (3)....	Off Catalina Island, California.	....	....	Do.
	1	32 [a].......	.....do.....................	....	....	Do.

[a] University of California station.

TURBONILLA (MORMULA) CATALINENSIS, new species.

Plate 11, figs. 10, 10*a*.

Shell elongate-conic, very slender. Nuclear whorls two and one-half, forming a depressed, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls well rounded, with appressed summits, moderately constricted at the sutures, marked at irregular intervals by strong varices; axial ribs somewhat sinuous, low, well rounded, weakening toward the summit; 16 upon the first, 18 upon the second to eighth, 24 upon the ninth and tenth, 26 upon the eleventh and twelfth, 28 upon the thirteenth and penultimate turn. Intercostal spaces as wide as the ribs, marked by nine equally spaced spiral lines, which pass up on the sides of the ribs, but do not cross their summits; space between the incised spiral lines is marked by exceedingly fine spiral striations. Periphery of last whorl well rounded. Base short, well rounded, marked by the feeble continuations of the axial ribs, and seven well incised spiral striations. Aperture rhomboidal; posterior angle obtuse; outer lip thin, showing the external markings within; as well as four color bands, one of which is at the periphery, another midway between the periphery and summit, the third at the summit, the fourth on the middle of the base; in addition to these bands there are four strong spiral folds, two on the base and two on the lip, which show deeply within the aperture; columella slender, somewhat twisted and slightly revolute.

The type and another specimen (Cat. no. 160147, U.S.N.M.) were dredged off Catalina Island. The type has 16 post-nuclear whorls and measures: Length 16.5 mm., diameter 4 mm. Two specimens were dredged by the University of California, at station 21 (3) off Catalina Island, California.

TURBONILLA (MORMULA) ESCHSCHOLTZI Dall and Bartsch.

Plate 11, fig. 8.

Turbonilla (*Mormula*) *eschscholtzi* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 513, pl. 45, fig. 10.

Shell large, elongate-conic, brown, having three obscure bands of dark brown, one of which is at the summit, another at the periphery, while the third is halfway between these on the exposed portion of the whorl of the spire. Nuclear whorls decollated. Post-nuclear turns moderately rounded, ornamented by low, rounded, rather distantly spaced, slightly protractive axial ribs which become weakened and somewhat flattened as they approach the appressed summit, and many fine lines of growth both on the ribs and in the intercostal spaces. In addition to the axial sculpture the whorls are crossed by twelve deeply incised, somewhat irregularly spaced spiral lines, the raised spaces between which are again divided by many fine striæ. All the spiral markings pass over the intercostal spaces and the ribs. Periphery of the last whorl obscurely angular, marked by the feeble continuations of the ribs which vanish immediately below the periphery and the usual fine lines of growth and spiral striation. Base rather short, well rounded, brown, with a narrow whitish band about the umbilicus, marked by closely spaced continuous wavy spiral striation, which varies in strength, several finer striæ alternating with the stronger. Aperture subquadrate, outer lip thin, showing four narrow dark-brown bands within, upon a lighter background—these are the three already referred to—and a fourth one on the base adjoining the periphery; columella almost vertical, slightly twisted and revolute.

The type (Cat. no. 196241, U.S.N.M.) was collected by Rev. G. W. Taylor, at Carter Bay, British Columbia; it has 11 post-nuclear whorls (the nucleus and probably three of the post-nuclear whorls being lost), and measures: Length 13.3 mm., diameter 4 mm. Another specimen from the same locality is in the Taylor collection. Three additional lots were collected by him in British Columbia; 1, a fragment, from west of Rose Spit, Queen Charlotte Islands; 6 at Departure Bay, 1 of which is Cat. no. 196242, U.S.N.M.; 15 at Port Simpson, 5 of which are Cat. no. 196243, U.S.N.M. No. 196242 is the largest specimen, it has 12½ whorls, having lost the nucleus and probably the first three of the succeeding turns, and measures: Length 17.8 mm., diameter 4.5 mm.

TURBONILLA (MORMULA) TRIDENTATA Carpenter.

Plate 11, figs. 12, 12*a*.

Chemnitzia tridentata CARPENTER, Jour. de Conch., vol. 13 (3d ser., vol. 5), 1865, p. 147. *Turbonilla* (*Lancea*) *tridentata* DALL and BARTSCH, Mem. Cal. Acad., vol. 3, p. 273, 1903, pl. 2, figs. 1, 1*a*. *Turbonilla* (*Mormula*) *tridentata* DALL and BARTSCH, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 511, 512, pl. 45, fig. 9.

Shell large, broad; chestnut colored, obscurely banded. Nuclear whorls three, helicoid, about one-third immersed, scarcely extending beyond the margin of the spire, their axis being at a right angle to the axis of the later whorls. Post-nuclear whorls slightly convex, somewhat contracted at the periphery and slightly shouldered at the summit; traversed by about 20 to 24 strong, well-rounded, somewhat oblique axial ribs, which continue faintly over the decidedly angular periphery of the last whorl and the base to the umbilical region; these ribs are considerably enfeebled on the last whorl of old shells and frequently become almost obsolete on these. The exposed portion of the whorls is traversed by five spiral grooves, which appear most prominently in the shallow and broad intercostal spaces, and less so on the ribs; these deep spiral lines are regularly spaced, leaving a broader interval on the middle of the exposed portion of the whorl; the base of the last whorl is likewise ornamented by spiral grooves, but here they appear less developed than on the spire. In addition to this the entire surface of the shell is marked by numerous very fine, somewhat wavy, spiral and axial striæ, which show most prominently on the last whorl and base, and give the shell a very minutely reticulated secondary sculpture. At irregular intervals the whorls are marked by thick callous varices, which are usually of a lighter color than the remainder of the shell. Aperture large, subquadrate; posterior angle acute; outer lip thin, having three strong internal lirations, joining the whitish, short, straight, revolute columella at a little less than a right angle. By transmitted light two spiral light color-bands become apparent on the inside of the lip, each of which is bordered by a zone of a darker color than the remaining shell. The general color effect of the exterior is that of a flesh-colored shell, covered by a dark epidermis, which is stretched tight over the ribs, permitting the lighter color beneath to shine through it at their summits.

Doctor Carpenter's type (Cat. no. 15315*b*, U.S.N.M.) was collected at Monterey, California. It has 11 post-nuclear whorls and measures: Length 11.1 mm., diameter 3.2 mm. The specimen figured (Cat. no. 150983, U.S.N.M.) is from San Pedro, California. It has 13 post-nuclear whorls and measures: Length 12.8 mm., diameter 3.6 mm.

The U. S. National Museum has five lots of this species: Cat. no. 15315*b* is the type from Monterey, California; Cat. no. 196239, four specimens dredged by the Bureau of Fisheries steamer *Albatross* at station 2902, off Santa Rosa Island, in 53 fathoms, fine gray sand and mud, with a bottom temperature of 45°; Cat. no. 196240, ten specimens from San Pedro, collected by Mrs. T. S. Oldroyd; Cat. no. 150983, three individuals, one of which is figured, dredged by Mrs. Oldroyd in 4 fathoms, at San Pedro; Cat. no. 46505, two shells from San Diego in the Stearns collection. In addition to these, specimens have been determined for Mr. Berry, from Monterey, 12 to 39 fathoms; University of California, off Catalina Island; Mrs. Oldroyd and Mr. Lowe, at San Pedro; Mr. Kelsey and Mr. Arnold, from San Diego.

TURBONILLA (MORMULA) AMBUSTA, new species.

Plate 11, fig. 13.

Shell medium size, slender, chestnut-brown. (Nuclear whorls decollated.) Post-nuclear whorls moderately rounded, appressed at the summit, slightly contracted at the periphery, marked by strong, rounded, slightly protractive axial ribs, of which 16 occur upon the first and second, 18 upon the third to seventh, the eighth has a strong varix, 20 upon the ninth, and 22 upon the tenth. On the penultimate whorl they are decidedly enfeebled. Intercostal spaces a little wider than the ribs, marked by ten equal and equally incised spiral lines, the space between which is crossed by numerous exceedingly fine spiral striations. Periphery and base of the last whorl well rounded, marked by fine lines of growth and numerous very fine spiral striations. Aperture rhomboidal; posterior angle obtuse; outer lip thin, showing the external sculpture within; also color bands, of which a narrow white one occurs at the periphery which is bounded on both sides by a brown band equaling it in width; another narrow brown band bordered on each side by a narrow white area occurs halfway between the periphery and the summit; columella slender, slightly curved and somewhat revolute.

The type (Cat. no. 152751, U.S.N.M.) was dredged in 10 fathoms, off San Pedro, California, by Mr. H. N. Lowe. It has lost the nucleus and probably the first post-nuclear whorl; the twelve remaining measure: Length 10 mm., diameter 2.3 mm. Another specimen from the same station is in Mr. Lowe's collection, and another was collected by Mrs. Oldroyd.

TURBONILLA (MORMULA) MAJOR C. B. Adams.

Plate 11, fig. 11.

Chemnitzia major C. B. Adams, Ann. Lyc. Nat. Hist. of N. Y., vol. 5, 1852, p. 391.

Shell elongate-conic, milk-white with a few irregular faint rust spots. (Nuclear whorls decollated.) Post-nuclear whorls well rounded, appressed at the summit, moderately contracted at the periphery, with moderately strongly developed varices at irregular intervals and almost straight, well developed, vertical axial ribs, of which 16 occur upon the first to fourth, 18 upon the fifth to ninth, 20 upon the tenth to twelfth, and 24 upon the penultimate turn. Intercostal spaces about double the width of the ribs, marked by seven well-incised spiral lines, which, if the fourth were removed, would be equally spaced. The spaces between the strongly incised lines are marked by exceedingly fine spiral striations. Sutures slightly impressed. Periphery and base of the last whorl well rounded, posterior half of the latter marked by seven equal, well incised, wavy spiral lines; anterior half with exceedingly fine spiral striations only. Aperture rhomboidal; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella strong and somewhat twisted.

Professor Adams' type (Cat. no. 225 Amherst College) is the only specimen of this species we have seen. It has lost the nucleus and probably the first two post-nuclear turns. The fourteen remaining measure: Length 9.7 mm., diameter 2.5 mm. It comes from Panama.

TURBONILLA (MORMULA) SANTOSANA, new species.

Plate 11, fig. 7.

Shell broadly conic, milk-white. (Nuclear whorls decollated.) Post-nuclear whorls inflated, well rounded, appressed at the summit, strongly contracted at the sutures, marked by strong, sublamellar, curved, slightly protractive axial ribs, of which 16 occur upon the second to fifth, 18 upon the sixth, and 20 upon the penultimate turn. Intercostal spaces about two times as wide as the ribs, terminating at the periphery, marked by a strong series of spiral pits at the periphery and six strongly incised lines, which are equally spaced, excepting the third and fourth below the summit, which are a little closer than the rest. Sutures strongly impressed. Periphery of the last whorl well rounded. Base short, well rounded, marked by three weakly incised, equally spaced, spiral striations. Aperture ?; outer lip reenforced within by five strong spiral cords; three of which, a little weaker than the rest, are between the periphery and the summit, and two on the base; columella strong, twisted, and revolute, with an oblique fold near its insertion.

The type (Cat. no. 162689,U.S.N.M.) was dredged at U. S. Bureau, of Fisheries station 2830, in 66 fathoms, temperature 74.1°, off Todos Santos, Lower California. It has lost the nucleus and probably the first postnuclear turn; the eight remaining whorls measure: Length 3.7 mm., diameter 1.3 mm.

TURBONILLA (MORMULA) PENTALOPHA Dall and Bartsch.

Plate 11, figs. 3, 3*a*.

Turbonilla (*Lancea*) *pentalopha* DALL and BARTSCH, Mem. Cal. Acad. Sci., vol. 3, 1903, p. 282, pl. 1, figs. 1, 1*a*.

Shell elongate-conic, chocolate-brown. Nuclear whorls small, three, forming a depressed, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls rounded on the earlier and flattened on the later turns, marked by strong, rounded, somewhat flexuose, slightly retractive, axial ribs, which are scarcely at all expressed on the first, and of which there are 18 upon the first and second, 20 upon the third and fourth, 22 upon the fifth, 24 upon the sixth, and 28 upon the penultimate turn. Intercostal spaces as wide as the ribs, marked by six equal and equally spaced, spiral series of pits which pass up on the sides of the ribs, but do not cross them. Sutures well impressed. Periphery and base of the last whorl well rounded, marked by the continuations of the axial ribs and seven equally spaced spiral striations, agreeing in strength with those on the spire. The first spiral line above and below the periphery are a little farther apart than the rest. Aperture large, oval; posterior angle acute; outer lip thin, showing the external sculpture within; provided with five strong, spiral cords, the anterior one of which is a little closer to its neighbor than the rest, which are equally spaced; columella moderately strong, curved, and revolute.

The type and 35 specimens (Cat. no. 46501, U.S.N.M.) were collected at San Diego, California. The type has ten post-nuclear whorls and measures: Length 8.5 mm., diameter 2.3 mm.

The following specimens have been examined:

U.S.N.M. Cat. no.	No. of specimens.	U.S.B.F. station.	Locality.	Depth, fathoms.	Disposition of material.
206885	1	....	San Pedro, California	....	U.S. Nat. Mus.
	4	....	.....do	....	Oldroyd coll.
46501	36	....	San Diego, California	....	U.S. Nat. Mus.
59328	5	....	.....do	....	Do.
206882	1	3564	.....do	5	Do.
206883	3	3566	.....do	3	Do.
206884	1	....	Southern California	....	U.S. Nat. Mus.
32284	1	....	Todos Santos Bay, Lower California.	....	Do.

TURBONILLA (MORMULA) HETEROLOPHA, new species.

Plate 11, fig. 9.

Shell small, slender, chestnut-brown, with wax yellow apex. Nuclear whorls two and one-half, forming a depressed, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is one-fourth immersed. Post-nuclear whorls flat, appressed at the summit, not constricted at the periphery, forming a spire of almost straight, uninterrupted outline. Axial sculpture consists of very broad, low, rounded, slightly retractive axial ribs, which are absent on the first turn but of which 20 occur upon the second to fourth, 28 upon the fifth and penultimate turn. Intercostal spaces very narrow, marked by six spiral lines of pits. Sutures poorly defined. Periphery and base of the last whorl well rounded, marked by the feeble continuations of the axial ribs and seven equally spaced, incised spiral lines. Aperture oval; posterior angle acute; outer lip thin, showing the external markings within; reënforced on the inside by four or five slender, equally spaced, spiral cords; columella strong, somewhat twisted.

The type and three specimens (Cat. no. 153065, U.S.N.M.) come from San Diego, California. The type has lost the nucleus; the seven post-nuclear whorls measure: Length 5.5 mm., diameter 1.8 mm. Cat. no. 162690, U.S.N.M., contains four specimens from San Hipolito Point, Lower California; collected by Mr. Henry Hemphill in whose collection there are five more from the same locality. Cat. no. 206886, U.S.N.M., one from San Diego, dredged in 12 fathoms.

TURBONILLA (MORMULA) IGNACIA, new species.

Plate 11, figs. 2, 2*a*.

Shell small, elongate-conic, milk-white. Nuclear whorls two and one-half, forming a depressed, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Post-nuclear whorls slightly rounded, appressed at the summit, moderately contracted at the suture, marked by low, rather broad, rounded, almost vertical axial ribs, of which 18 occur upon the second to fourth, 20 upon the fifth, 22 upon the sixth, 24 upon the seventh, and 28 upon the penultimate turn. Intercostal spaces a little narrower than the ribs, marked by six spiral series of well incised, equally spaced pits. Periphery and base of the last whorl well rounded, marked by the very feeble continuations of the axial ribs, and numerous exceedingly fine spiral striations. Aperture rhomboidal; posterior angle obtuse; outer lip thick, reenforced by two strong spiral lamellæ, one of which is a little posterior to the periphery and the other a little posterior to the middle between the periphery and the summit; columella rather strong, decidedly twisted with an oblique fold a little below its insertion.

The type and two other specimens (Cat. no. 162691, U.S.N.M.) comes from San Ignacio Lagoon, Lower California. The type has nine post-nuclear whorls and measures: Length 4.1 mm., diameter 1.2 mm.

TURBONILLA (MORMULA) PERISCELIDA, new species.

Plate 11, figs. 6, 6*a*.

Shell pupiform, milk-white, shining. Nuclear whorls small, two, forming a depressed, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-half immersed. Post-nuclear whorls flattened, slightly contracted at the sutures, appressed at the summit, with a strong, sloping shoulder which extends over the posterior fourth of the space between the sutures, marked by strong, vertical axial ribs, of which about 14 occur upon all the whorls. These ribs become flattened and decidedly expanded on the shoulder. Intercostal spaces about three times as wide as the ribs, shallow, smooth. Sutures slightly constricted. Periphery of the last whorl somewhat attenuated, base well rounded, smooth. Aperture oval; somewhat effuse anteriorly; posterior angle acute; outer lip reënforced by three, broad, internal spiral lirations, two of which are posterior to the periphery and the other immediately below it; columella decidedly twisted and somewhat revolute; reënforced by the base, provided with a very strong, oblique fold at its insertion; parietal wall covered by a thin callus.

The type and two specimens (Cat. no. 163266, U.S.N.M.) were dredged at U. S. Bureau of Fisheries station 2901, off Santa Rosa

Island, California, in 48 fathoms, temperature 55°.1. The type has seven post-nuclear whorls and measures: Length 3.2 mm., diameter 1 mm.

TURBONILLA (MORMULA) PHALERA, new species.

Plate 11, fig. 5.

Shell small, milk-white. (Nuclear whorls decollated.) Post-nuclear whorls well rounded, slightly contracted at the sutures, marked by moderately strong, curved, protractive axial ribs, of which 14 occur upon the first to fourth, 16 upon the fifth, and 18 upon the penultimate turn. Intercostal spaces a little wider than the ribs, well impressed, terminating at the periphery. Sutures well marked. Periphery of the last whorl slightly angulated. Base short, well rounded, smooth. Aperture rhomboidal; posterior angle obtuse; outer lip thick, with a single, strong, internal cord, a little posterior to the periphery; columella strong, somewhat twisted, with a weak fold near its insertion.

The type (Cat. no. 163267, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2794, in 62 fathoms, temperature 59°.6, in Panama Bay. It has seven post-nuclear whorls, having lost the nucleus and probably the first post-nuclear turn, and measures: Length 2.5 mm., diameter 0.8 mm.

Subgenus DUNKERIA Carpenter.

Dunkeria Carpenter, Cat. Mazatlan Shells, 1856, pp. 433–434.

Turbonillas having the whorls stronger, rounded, and usually shouldered, marked by strong axial ribs and strong spiral cords, the junctions of which are frequently subnodulous.

Type.—Dunkeria subangulata.

Doctor Carpenter, after diagnosing *Dunkeria laminata*,[a] writes: "This beautiful Fenelloid species may be regarded as the type of the group of *Dunkeria*." Unfortunately this species was not included in the original list, hence can not serve as type for the group. We had selected the first specimen, *Dunkeria paucilirata*, of the four cited by Carpenter in his Mazatlan Catalogue, for the type in our Synopsis of the Genera, Subgenera and Sections of the Family Pyramidellidæ.[b] Since then we have seen Doctor Carpenter's material in the British Museum and we find that *Dunkeria paucilirata* is a *Pyrgisculus*, and that the second species *Dunkeria subangulata* resembles *D. laminata* in form and sculpture and thus bears out the author's intent of typifying the group. *D. cancellata* must be removed to *Pyrgisculus* and *D. intermedia* to *Evalina*.

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[a] Ann. Mag. Nat. Hist., 1865, p. 396.

[b] Proc. Biol. Soc. Wash., vol. 17, 1904, p. 8.

KEY TO THE SPECIES OF THE SUBGENUS DUNKERIA.

- Spiral sculpture between the sutures of uniform character.
  - Spiral cords between the sutures 7½ .... *sedillina*, p. 121.
  - Spiral cords between the sutures 5 or 5½.
    - Adult shell more than 6 mm. long .... *laminata*, p. 122.
    - Adult shell less than 4 mm. long.
      - Whorls slightly rounded .... *hipolitensis*, p. 123.
      - Whorls strongly rounded.
        - Shell elongate-ovate.
          - Basal cords 5 .... *subangulata*, p. 124.
          - Basal cords 6 .... *andrewsi*, p. 124.
        - Shell elongate-conic .... *excolpa*, p. 123.
- Spiral sculpture between the sutures not of uniform character.
  - Adult shell more than 10 mm. long .... *arata*, p. 125.
  - Adult shell less than 6 mm. long .... *genilda*, p. 125.

TURBONILLA (DUNKERIA) SEDILLINA, new species.

Plate 12, figs. 3, 3*a*.

Shell elongate-conic, milk-white. Nuclear whorls two and one-half, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is one-fourth immersed. Post-nuclear whorls flattened in the middle, with a strong sloping shoulder, which extends over the posterior third between the sutures, appressed at the summit and slightly constricted at the suture, marked by slender, sublamellar, sinuous, almost vertical axial ribs, of which 16 occur upon the first three whorls, 18 upon the fourth to sixth, 20 upon the seventh and eighth, and 24 upon the penultimate turn. Intercostal spaces three times as wide as the ribs, marked by seven rather broad and deeply incised spiral grooves, the interspaces appearing as flattened cords, of which the one between the second and third groove below the summit is at the shoulder and a little broader than the rest. Sutures strongly constricted. Periphery of the last whorl somewhat angulated. Base short, well rounded, marked by seven irregular and irregularly spaced spiral striations. Aperture broadly oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, and decidedly curved.

The type and nine specimens (Cat. no. 162697 U.S.N.M.) were dredged at U. S. Bureau of Fisheries station 2823, in 26½ fathoms, off La Paz, Gulf of California. It has nine post-nuclear whorls and measures: Length 5.3 mm., diameter 1.4 mm. Cat. no. 206887, U.S.N.M., one specimen at U. S. Bureau of Fisheries station 2822, in 21 fathoms, also from La Paz. Cat. no. 206888 U.S.N.M., one specimen, from U. S. Bureau of Fisheries station 2826, 9½ fathoms, off Ceralvo Island, Gulf of California.

TURBONILLA (DUNKERIA) LAMINATA Carpenter.

Plate 12, figs. 16, 16*a*.

Dunkeria laminata CARPENTER, Ann. Mag. Nat. Hist., 3d ser., vol. 15, 1865, p. 396.

Shell broadly conic, wax yellow at the tip, chestnut-brown on the last whorl, columellar area white. Nuclear whorls two and one-half, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls inflated, strongly rounded, moderately contracted at the suture, marked by very regular, rounded, strong, almost vertical axial ribs, of which 18 occur upon the first, 24 upon the second, 26 upon the third, 28 upon the fourth and fifth, 30 upon the sixth and seventh, and about 40 upon the penultimate turn. Intercostal spaces a little wider than the ribs, crossed by five spiral series of broad, deep pits, which cause the five intermediate areas to appear as broad, raised bands, which are about as wide as the ribs, and render their junction with the ribs tuberculate. Sutures strongly impressed. Periphery of the last whorl well rounded. Base moderately long, marked by the faint continuations of the axial ribs, and about ten spiral lirations, which are narrower and less strongly developed about the umbilical area. Aperture broadly oval; posterior angle acute; outer lip thin, showing the external markings within; columella strongly curved, and completely reënforced by the base.

The specimen described and figured (Cat. no. 946*b*, U.S.N.M.) was collected by Cooper at San Pedro, California. It has nine post-nuclear whorls and measures: Length 6.6 mm., diameter 2.1 mm.

The coloration of this species varies considerably; it may be unicolor, white to chestnut, or diversely banded.

The following specimens have been examined:

U.S.N.M. Cat. no.	No. of specimens.	Locality.	Depth, fathoms.	Collector.	Disposition of material.
14946	3	San Pedro, California	....	Cooper	U. S. Nat. Mus.
130564	3	do	....	Oldroyd	Do.
	34	do	....	do	Do.
	62	do	....	do	Oldroyd coll.
	....	do	....	Roper	Roper coll.
	....	do	....	Lowe	Lowe coll.
	....	Terminal Island, California	....	Eshnaur	Eshnaur coll.
160111	3	Off Ballast Point (San Diego), California.	12–15	Kelsey	U. S. Nat. Mus.
153049	7	Ocean Beach, San Diego, California.	....	do	Do.
152315	1	do	....	do	Do.
152317	2	San Diego, California	....	do	Do.
109366	2	do	....	Hemphill	Do.
206891	1	San Diego, U. S. Bureau of Fisheries (station 3566).	3	....	Do.
	2	San Diego, California	....	Hemphill	Arnold coll.
	2	do	....	Lowe	Lowe coll.
	1	San Diego (Whites Point), California.	....	Oldroyd	Oldroyd coll.
	4	San Diego (foot of Ash street), California.	....	do	Do.
	1	Station 37, off San Diego, California.	....	Univ. Cal	Univ. Cal. coll.
	1	Station 32, off Catalina Island, California.	....	do	Do.
32284*b*	1	Todos Santos Bay, Lower California.	....	Hemphill	U. S. Nat. Mus.
106517	5	Point Abreojos, Lower California.	....	do	Do.

TURBONILLA (DUNKERIA) HIPOLITENSIS, new species.

Plate 12, figs. 8, *8a*.

Shell milk-white, with a light yellow narrow band midway between the sutures. Nuclear whorls small, two and one-half, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls moderately rounded, slightly shouldered at the summit but very slightly protracted at the suture, marked by moderately strong, rounded, retractive axial ribs, of which 18 occur upon the second, 20 upon the third, 24 upon the fourth and fifth, and 30 upon the penultimate turn. Intercostal spaces as wide as the ribs, crossed by five series of broad spiral pits, which are not quite as wide as the five raised cords which they bound, and which render the ribs somewhat nodulose at their junction. Periphery and base of the last whorl well rounded, the latter marked by six spiral cords and a feeble continuation of the axial ribs. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella moderately strong, curved, reënforced by the base.

The type and two additional specimens (Cat. no. 206889, U.S.N.M.) comes from San Hipolito Point, Lower California. The type has seven post-nuclear whorls and measures: Length 3.3 mm., diameter 1.2 mm.

TURBONILLA (DUNKERIA) EXCOLPA, new species.

Plate 12, figs. 4, *4a*.

Shell wax yellow on the early whorls, ranging to chestnut brown [illegible] the last. Nuclear whorls two and one-half, forming a dep[illegible]coid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls well rounded, marked by well-developed, narrow, rounded, almost vertical axial ribs, of which 24 occur upon the first to third, 26 upon the fourth, 28 upon the fifth, and about 36 upon the penultimate turn. Intercostal spaces about as wide as the ribs, crossed by five series of spiral pits which are as wide as the five raised spaces which they separate. The junction of these raised cords with the ribs renders them nodulous. Sutures constricted. Periphery of the last whorl and base well rounded, the latter marked by seven spiral cords. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within columella slender, somewhat twisted, reënforced by the base.

The type (Cat. no. 206892 U.S.N.M.) comes from the Gulf of California. It has seven post-nuclear whorls and measures: Length 3.7 mm., diameter 1.1 mm.

TURBONILLA (DUNKERIA) SUBANGULATA Carpenter.

Plate 12, fig. 11.

Dunkeria subangulata Carpenter, Cat. Mazatlan Shells, 1856, p. 434.

Shell elongate-ovate, white. Nuclear whorls two, forming a moderately elevated spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls strongly rounded, obliquely shouldered at the summit, marked by slender, vertical, axial ribs, of which 20 occur upon the first, 22 upon the second and third, and 24 upon the penultimate turn. In addition to the axial ribs, the whorls are crossed by four slender, spiral cords between the sutures and by a fifth at the periphery and five on the base. The spaces inclosed by the ribs and cords appear as round pits. Periphery and base of the last whorl well rounded. Aperture suboval; outer lip thin; columella somewhat twisted and reflected; parietal wall covered with a thin callus.

An adult and a young specimen are on tablet 2008, Liverpool collection, British Museum. The adult has five post-nuclear whorls and measures: Length 2.8 mm., diameter 0.93 mm.

TURBONILLA (DUNKERIA) ANDREWSI, new species.

Plate 12, figs. 7, 7*a*.

Shell small, conic, light chestnut, umbilical area white. Nuclear whorls two and one-half, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls well rounded, moderately contracted at the suture, with a sloping shoulder which extends over the posterior third between the sutures, marked by slender, well-rounded, slightly retractive axial ribs, of which 18 occur upon the first, 20 upon the second and third, 22 upon the fourth, and 32 upon the penultimate turn. Intercostal spaces about one and one-half times as wide as the ribs upon all but the last whorl, marked by five spiral series of broad pits, which are wide as the five cord-like interspaces which they bound and which render the ribs somewhat tuberculate at their junction. Sutures well impressed. Periphery and base of the last whorl well rounded, the latter marked by the continuation of the axial ribs, which extend feebly to the umbilical area, and six spiral cords which grow successively a little narrower from the periphery to the umbilical area. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella rather thick, reënforced by the base; parietal wall covered by a thin callus.

The type (Cat. no. 162696 U.S.N.M.) comes from Panama. It has six post-nuclear whorls and measures: Length 2.9 mm., diameter 1 mm.

Prof. C. B. Adams's type lot of *Chemnitzia clathratula* in the Amherst collection contains two specimens of this species. His type lot of *Chemnitzia communis* contains another specimen. Both lots are from Panama.

Named for Prof. Lancelot W. Andrews.

TURBONILLA (DUNKERIA) ARATA, new species.

Plate 12, fig. 12.

Shell large and rough. (Nuclear whorls decollated.) Post-nuclear whorls somewhat inflated and overhanging, appressed at the summit, well rounded, with the greatest convexity on the anterior third between the sutures; marked by strong, narrow, rounded, well raised, retractive axial ribs, of which 18 occur upon the first four, 20 upon the fifth, 22 upon the sixth and seventh, 24 upon the eighth, 26 upon the ninth, and 28 upon the penultimate turn. Intercostal spaces about twice as wide as the ribs, marked by very deep pits, which leave the intervening spaces as strongly elevated cords, nine of which occur between the sutures. Of these cords the second and fifth below the summit and the first above the periphery are of equal width and wider than the rest; the first, which forms the summit, and the three posterior to the one at the periphery are again of equal width; the third and fourth below the summit are a little more slender than the rest; the pit at the periphery and those that bound the fifth cord are a little wider than the rest; the first and second below the summit and the second and third pit above the periphery are equal and those between the third and fourth cords are also equal. Sutures well impressed. Periphery of the last whorl inflated. Base well rounded, marked by the feeble continuations of the axial ribs and eight almost equal incised spiral lines. Aperture large, oval; posterior angle acute; outer lip somewhat flaring in its middle; columella slender, curved, and slightly revolute.

The type (Cat. no. 206890, U.S.N.M.) was dredged off Santa Catalina Island, California. It has twelve post-nuclear whorls and measures: Length 10.2 mm., diameter 2.4 mm.

TURBONILLA (DUNKERIA) GENILDA, new species.

Plate 12, fig. 2.

Shell elongate-conic, white on the shoulder, the rest light brown. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, well contracted at the sutures, with a strong sloping shoulder which extends over the posterior third between the sutures, rendering them angulated at its anterior termination. The whorls are marked by strongly elevated, narrow, axial ribs, which are vertical on the early whorls and decidedly retractive on the later ones. Intercostal spaces about two and one-half times as wide as the ribs, marked by a very broad, deep, peripheral pit and two less wide on the anterior third between the sutures; the median third is marked by three moderately broad pits, separated by slender lirations, the shoulder has a narrow line immediately below the summit and three well incised lines anterior to this, the anterior of which is less strongly developed than the other two. The spaces between the second and third, and third and fourth, posterior to the peripheral one, are wider than the rest. All the raised areas between the pits are crossed by very fine spiral striations. Periphery of the last whorl slightly angulated. Base short, well rounded, marked by the feeble continuations of the axial ribs and ten spiral striations, which decrease in size and spacing from the periphery to the umbilicus. Aperture rhomboidal; posterior angle obtuse; outer lip thin; columella slender, very oblique, and slightly revolute.

The type (Cat. no. 96806, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2799, in 30 fathoms, on green mud bottom in Panama Bay. It has lost the nucleus and probably the first post-nuclear turn. The nine remaining measure: Length 5.3 mm., diameter 1.6 mm. Cat. no. 162694, U.S.N.M., contains three more specimens from the same station.

Subgenus **PYRGISCULUS** Monterosato.

Pyrgisculus Monterosato, Conch. Medit., 1884, p. 28.

Turbonillas with turrited spire having the whorls decidedly contracted at the suture, and tabulated at the summit, marked on the spire and base by many well incised spiral lines.

Type.—*Melania scalaris* Philippi.

KEY TO THE SPECIES OF THE SUBGENUS PYRGISCULUS.

- Whorls shouldered.
  - Shoulder strongly excavated.
    - Axial ribs almost interrupted at the shoulder .... *monilifera*, p. 126.
    - Axial ribs continuing strong to the summit .... *cancellata*, p. 127.
  - Shoulder not excavated.
    - Axial ribs 12–8 .... *festiva*, p. 127.
    - Axial ribs 16–20 .... *eucosmia*, p. 128.
- Whorls not shouldered.
  - Spiral striations between the sutures 8 .... *paucilirata*, p. 129.
  - Spiral striations between the sutures 15 .... *swani*, p. 129.

TURBONILLA (PYRGISCULUS) MONILIFERA, new species.

Plate 12, fig. 15.

Shell pupiform, bluish-white. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, scarcely contracted at the suture, with a strong shoulder that covers the posterior fourth between the sutures, forming a decided angle at its termination. The whorls are marked by strong, axial ribs, of which 16 occur upon the second to fourth, 18 upon the fifth, and 20 upon the penultimate turn. Intercostal spaces about twice as wide as the ribs, marked by eleven incised spiral lines between the shoulder and the suture, which are a little less strongly developed and a little closer spaced near the suture. The shoulder is marked by five slender, spiral lines. Periphery and base of the last whorl well rounded, the latter marked by the feeble continuations of the axial ribs, and about eighteen slender, incised spiral lines. Aperture broadly oval; posterior angle acute; outer lip rather thick; columella decidedly curved and somewhat twisted.

The type (Cat. no. 58334, U.S.N.M.) comes from the Gulf of California. It has lost the nucleus. The seven remaining whorls measure: Length 5.6 mm., diameter 1.8 mm.

TURBONILLA (PYRGISCULUS) CANCELLATA Carpenter.

Plate 12, fig. 6.

Dunkeria cancellata Carpenter, Cat. Mazatlan Shells, 1856, p. 435.

Shell reddish-brown. Nuclear whorls two, tumid, helicoid, having their axis at right angles to that of the succeeding turns. Post-nuclear whorls two and one-half, decidedly inflated, strongly angulated at the summit; marked by many acute axial ribs and somewhat less strong spiral threads, which render the whorls elegantly cancellated. Outer lip angulated, columella without fold.

Doctor Carpenter's type was found on a specimen of *Spondylus* at Mazatlan, Mexico. It is preserved in the Liverpool collection on tablet 2009 in the British Museum. This young individual has two and one-half post-nuclear whorls, measuring: Length 0.95 mm., diameter 0.5 mm. It has very strong tabulated shoulders, acute lamellar axial ribs, of which about eighteen occur on the last whorl, and fine, spiral striations in the broad intercostal spaces.

TURBONILLA (PYRGISCULUS) FESTIVA De Folin.

Plate 12, fig. 5.

Turbonilla festiva De Folin, Les Méléagrinicoles, 1867, pp. 49, 50, pl. 5, figs. 4–6.

Shell smooth, vitreous, elongate-conic. Nuclear whorls two and one-half, forming a moderately elevated, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Post-nuclear whorls moderately rounded, strongly contracted at the sutures, having a strong sloping shoulder which extends over the posterior fourth of the space between the sutures; the whorls are crossed by strong lamellose axial ribs which extend over the periphery to the umbilical area. Ten of these occur upon the first, 12 upon the second, and 8 upon the remaining turns. Intercostal spaces about eight times as wide as the axial ribs, crossed by fine spiral striations, of which about fourteen occur between the sutures. Base slightly excavated. Aperture oval; columella decidedly curved.

The type has five post-nuclear whorls and measures: Length 2.5 mm., diameter 0.6 mm.

The species described in Les Méléagrinicoles were taken from pearl oysters which are said to have come from Negritos and the Margarita Island in the Bay of Panama. No specific station is cited for this species. It has been referred to Panama by Tryon in his Manual of Conchology.

TURBONILLA (PYRGISCULUS) EUCOSMIA, new species.

Plate 12, figs. 13, 13*a*.

Shell pupoid, light yellow, with a narrow, darker band at the shoulder. Nuclear whorls one and three-fourths, forming a depressed, helicoid spire, the axis of which is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls slightly flattened in the middle, with a strong sloping shoulder which extends over the posterior fourth between the sutures and renders them decidedly angulated at its anterior termination; slightly contracted at the suture, marked by strong, sublamellar, axial ribs, which are vertical on the first four whorls and decidedly retractive on the later ones. Of these ribs, 16 occur upon the first five whorls, 18 upon the sixth, and 20 upon the penultimate turn. Intercostal spaces about two and one-half times as wide as the ribs, marked by a double series of very broad pits, one of which is at the periphery and the other immediately anterior to the shoulder. The space between these pits is divided into four equal cords by three moderately wide pits, the cords in turn being divided by a fine incised line. The shoulders are marked by five equal and equally spaced, incised, spiral lines. Sutures strongly impressed. Base moderately long, well rounded, marked by eight almost equal and equally spaced spiral striations. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, sinuous, and strongly reflected; parietal wall covered with a strong callus.

The type (Cat. no. 162698, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2822, in 21 fathoms, off La Paz, Lower California. It has eight post-nuclear whorls and measures: Length 4.8 mm., diameter 1.4 mm. Two additional specimens (Cat. no. 163251*a*, U.S.N.M.) were dredged at U. S. Bureau of Fisheries station 2827, in 10 fathoms, off Ceralvo Island, Gulf of California.

TURBONILLA (PYRGISCULUS) PAUCILIRATA Carpenter.

Plate 12, fig. 10

Dunkeria paucilirata Carpenter, Cat. Mazatlan Shells, 1856, p. 434.

The type and only known individual of this species is an imperfect specimen mounted on tablet 2007 of the Liverpool collection in the British Museum.

The nucleus is two-thirds immersed, and the axis is at right angles to that of the succeeding turns. Post-nuclear whorls strongly rounded, well constricted at the sutures; moderately slender, almost vertically curved axial ribs, of which 16 occur upon the first and about 18 upon the rest of the turns. Intercostal spaces very broad, shallow, marked by fine spiral striations. Sutures strongly constricted. It has five post-nuclear whorls and measures: Length 2.1 mm., diameter 0.7 mm.

The specimen was collected on a *Chama* at Mazatlan, Mexico.

TURBONILLA (PYRGISCULUS) SWANI, new species.

Plate 12, figs. 9, 9*a*.

Shell elongate, pupoid, semitransparent, light yellow. Nuclear whorls at least two, forming a low helicoid spire, whose axis is almost at right angles to that of the succeeding turns, in the first of which it is about one-half immersed. Post-nuclear whorls inflated, very strongly rounded, appressed at the summit, contracted at the periphery, marked by strong, decidedly curved, lamellar, protractive axial ribs, of which 18 occur upon all but the last whorl, the latter has 20. Intercostal spaces twice as wide as the ribs, marked by 15 almost equal and almost equally spaced spiral series of pits. Sutures constricted. Periphery and base of the last whorl well rounded, the latter marked by the feeble continuations of the axial ribs, and about 20 feeble very wavy incised spiral lines. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, curved, with the posterior two-thirds reënforced by the base.

The type (Cat. no. 160485, U.S.N.M.) comes from San Pedro, California. It has eight post-nuclear whorls and measures: Length 5 mm., diameter 1.5 mm.

Named for J. G. Swan.

Subgenus ASMUNDA Dall and Bartsch.

Asmunda Dall and Bartsch, Proc. Biol. Soc. Wash., vol. 17, 1904, p. 9.

Shell with strong axial ribs which terminate at the keeled periphery; base with many axial riblets, a strong median spiral cord, and a constriction between this and the peripheral keel.

Type.—*Chemnitzia turrita* C. B. Adams.

TURBONILLA (ASMUNDA) TURRITA C. B. Adams.

Plate 12, figs. 14, 14*a*.

Chemnitzia turrita C. B. Adams, Ann. Lyc. Nat. Hist. of N. Y., vol. 5, 1852, pp. 393, 394.

Shell elongate-conic, milk-white. Nuclear whorls small, two and one-half, forming an elevated helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls moderately well rounded, with a very broad, flat, tabulated summit, marked by strong, lamellar, somewhat sinuous, almost vertical axial ribs, of which 18 occur upon the first, 14 upon the second to fifth, 16 upon the sixth, 18 upon the seventh, 20 upon the eighth, and 24 upon the penultimate whorl. Intercostal spaces about four times as wide as the ribs, deeply impressed, smooth. Sutures very strongly marked. Periphery of the last whorl marked by a strong keel, middle of the base with a strong tumid fasciole, the space between which and the periphery forms a shallow, well-rounded channel. Umbilical area slightly excavated. In addition to this sculpture, the base is crossed by many, subequal, slender, raised axial threads, which do not correspond to the axial ribs, between the sutures. Aperture irregular; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella strong and slightly curved.

Cat. no. 230 of Professor Adams's Panama Shells, in Amherst College, contains two specimens, the cotypes. We have selected the better of the two for our description and figure. This has 10 post-nuclear whorls and measures: Length 4.7 mm., diameter 1.3 mm. In the same collection, no. 251, *Rissoa*, sp. indet., a fragment, belongs here.

Subgenus CARELIOPSIS Mörch.

Careliopsis Mörch, Malak. Blätt., 1874, p. 169.

Turbonillas having the surface marked by many subequal well-impressed spiral lines and numerous feeble axial riblets. Under low magnification the sculpture appears to consist of impressed pitted spiral lines only.

Type.—*Monoptygma* (*Careliopsis*) *styliformis* Mörch.

TURBONILLA (CARELIOPSIS) STENOGYRA, new species.

Plate 12, figs. 1, 1*a*.

Shell acicular, transparent. Nuclear whorls small, two, forming a depressed, helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is very slightly immersed. Post-nuclear whorls slightly rounded, somewhat contracted immediately below the sutures which causes the summits to appear somewhat exserted. The first three post-nuclear whorls show traces of axial ribs on the posterior half of the whorls. Of these there appear to be about 18 upon the third turn. The whorls are marked by spiral lines of well-impressed pits, of which 6 appear upon the first, 7 upon the second, 8 upon the third and fourth, 10 upon the fifth, 11 upon the sixth, 14 upon the seventh, and 18 upon the penultimate turn, between the sutures. Upon the last, they are more or less irregular. Sutures poorly marked. Periphery of the last whorl well rounded. Base moderately long, well rounded, marked by 11 spiral lines of pits. Aperture oval; posterior angle acute; outer lip thin, showing the external markings within; columella moderately strong, very strongly curved, reënforced by the base.

The type and another specimen (Cat. no. 162699, U.S.N.M.) comes from San Hipolito Point, Lower California. The type has nine post-nuclear whorls and measures: Length 5.5 mm., diameter 1.2 mm.

Genus ODOSTOMIA Fleming.

Odostomia Fleming, Edinburgh Encycl., vol. 7, 1817, pt. 1, p. 76.=*Odontostomia* Jeffreys, Mal. and Conch. Mag., 1839, p. 33.=*Turritostomia* Sacco, Moll. del Piemonte e della Liguria, 1892, p. 41, same type.

Shell with sinistral apex, usually short, few whorled, subconic or ovate, with a single columellar fold which varies in strength and sometimes is not apparent at the aperture. The sculpture varies from smooth to lamellar axial ribs and spiral keels.

Type.—Turbo plicatus Montagu.

Of the forty subgenera now recognized under Odostomia nineteen have been found represented on the west coast of America.

KEY TO THE SUBGENERA OF ODOSTOMIA.

Early post-nuclear whorls sculptured differently from the later ones. *Lysacme*, p. 132.
Post-nuclear whorls sculptured similarly throughout.
    Varices present .... *Salassiella*, p. 133.
    Varices absent.
        Axial ribs present.
            Axial ribs rounded.
                Spiral markings absent or if present consisting of microscopic striations only .... *Salassia*, p. 134.
                Spiral markings consisting of several to many raised threads.
                    Spiral sculpture less strong than axial, not nodulous. *Besla*, p. 135.
                    Spiral sculpture equal to the axial, nodulose between the sutures .... *Chrysallida*, p. 136.
                Spiral markings consisting of incised lines.
                    Spiral lines on spire and base .... *Pyrgulina*, p. 169.
                    Spiral lines on base only .... *Egila*, p. 170.
            Axial ribs lamellar.
                Spiral sculpture lamellar.
                    Intersection of axial and spiral sculpture cuspidate, *Haldra*, p. 171.
                    Intersection of axial and spiral sculpture not cuspidate, *Ividella*, p. 172.

- Post-nuclear whorls sculptured similarly throughout—Continued.
  - Varices absent—Continued.
    - Axial ribs present—Continued.
      - Axial ribs feeble, usually only indicated near the summit of the whorls.
        - Spiral sculpture consisting of several strong, broad cords, one or more of the posterior of which are crenulated .... *Miralda*, p. 176.
        - Spiral sculpture consisting of many subequal lirations.
          - Whorls tabulated at the summit .... *Ivara*, p. 179.
          - Whorls not tabulated at the summit .... *Evalina*, p. 180.
      - Axial sculpture reduced to mere lirations, frequently only present between the spiral cords.
        - Shell umbilicated .... *Iolæa*, p. 181.
        - Shell not umbilicated .... *Menestho*, p. 184.
      - Axial sculpture represented by lines of growth only.
        - Spiral markings consisting of well incised lines .... *Evalea*, p. 192.
        - Spiral markings consisting of many fine wavy striations, *Amaura*, p. 218.
        - Spiral sculpture consisting of a strong peripheral keel, *Scalenostoma*, p. 229.
        - Spiral sculpture absent.
          - Aperture rissoid .... *Heida*, p. 231.
          - Aperture not rissoid .... *Odostomia*, p. 231.

Subgenus LYSACME Dall and Bartsch.

Lysacme Dall and Bartsch, Proc. Biol. Soc. Wash., vol. 17, 1904, p. 14.

Early post-nuclear whorls loosely coiled, plain, later ones closely coiled with a spiral keel at the periphery and another at the summit of the whorl; base spirally lirate.

Type.—*Chrysallida clausiliformis* Carpenter.

ODOSTOMIA (LYSACME) CLAUSILIFORMIS Carpenter.

Plate 13, fig. 2.

?? *Chrysallida clausiliformis* Carpenter, Cat. Mazatlan Shells, 1856, p. 426.

Shell clausiliform. Nuclear whorls two, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is scarcely at all immersed. First two and one-half post-nuclear whorls loosely coiled, strongly rounded, smooth, separated by very strongly impressed sutures. Remaining whorls moderately rounded, with a strong spiral cord at the summit and another at the periphery, the two being closely appressed at the sutures. Base prolonged, marked by low spiral cords. Aperture irregularly oblong, decidedly effuse anteriorly; columella provided with a strong fold at its insertion. Operculum paucispiral.

Four specimens were taken off *Chama* at Mazatlan, of which the best preserved is on tablet 1987, Liverpool collection, British Museum, which has seven post-nuclear whorls and measures: Length 3.8 mm., diameter 0.9 mm.

It is a curious shell, entirely different from anything else that we have seen. Unfortunately the outer surface is too badly worn to permit of a positive statement regarding its finer markings.

SALASSIELLA, new subgenus.

Shell pupiform, whorls inflated, marked by axial ribs which extend undiminished from the summit to the umbilical area. Varices strong, irregularly distributed.

Type.—*Odostomia* (*Salassiella*) *laxa* Dall and Bartsch.

KEY TO THE SPECIES OF THE SUBGENUS SALASSIELLA.

Summit of the whorls rounded	*laxa.*
Summit of the whorls tabulated	*richi.*

ODOSTOMIA (SALASSIELLA) LAXA, new species.

Plate 13, figs. 8, 8*a*.

Shell pupiform, milk-white. Nuclear whorls at least two, small, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about two-thirds immersed. Post-nuclear whorls inflated, contracted at the sutures, and strongly roundedly shouldered at the summit, marked by lamellar, flexuose axial ribs, which are only feebly expressed on the first. On the second there are 18, on the third 20, 22 upon the fourth, and 28 upon the penultimate turn, upon which there is a strong varix. Intercostal spaces about one and one-half times as wide as the ribs, well impressed. Sutures constricted. Periphery and base of the last whorl well rounded, marked by the continuations of the axial ribs. Aperture broadly oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, strongly curved, and slightly revolute, provided with a weak fold at its insertion.

The type and another specimen (Cat. no. 106512, U.S.N.M.) comes from Scammon Lagoon, Lower California. It has six post-nuclear whorls, and measures: Length 4.3 mm., diameter 1.7 mm. Another specimen (Cat. no. 286893, U.S.N.M.) comes from San Diego, California.

ODOSTOMIA (SALASSIELLA) RICHI, new species.

Plate 13, figs. 6, 6*a*.

Shell small, broadly conic, white. Nuclear whorls three, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls strongly rounded, moderately contracted at the suture, broadly tabulated at the shoulder, marked by strong, lamellar, axial ribs, of which 16 occur upon the first, 14 upon the second and third, and 18 upon the penultimate turn. Intercostal spaces somewhat wider than the ribs, strongly impressed. Periphery of the last whorl marked by a broad, low keel. Base with a strongly raised tumescence about the umbilical area, the space between which and the peripheral keel appears slightly concave. The axial ribs continue weakly over the base. A strong varix appears on the last whorl, between two axial ribs, and extends from the summit to the umbilical chink. Aperture suboval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella strong, straight, and decidedly revolute; parietal wall covered by a thin callus.

The type (Cat. no. 160484, U.S.N.M.) comes from San Pedro, California. It has five and one-half post-nuclear whorls, and measures: Length 3 mm., diameter 1.4 mm.

Subgenus SALASSIA De Folin.

Salassia De Folin, Const. d. Chemnitzidæ, 1885, p. 15.

Shell pupiform, whorls not inflated, marked by axial ribs which extend from the tabulated summit of the whorl to the umbilical area. Varices absent.

Type.—Salassia tropidita Dall and Bartsch.

KEY TO THE SPECIES OF THE SUBGENUS SALASSIA.

Summit of the whorls tabulated	*tropidita*, p. 134.
Summit of the whorls rounded	*scalariformis*, p. 135.

ODOSTOMIA (SALASSIA) TROPIDITA, new name.

Plate 13, fig. 3.

Salassia carinata De Folin, Fonds de la Mer, vol. 2, 1872, p. 168, pl. 6, fig. 6; not *Scalenostoma carinata* Deshayes, 1863, nor *Odostomia carinata* H. Adams, 1873.

Shell pupiform, white. Nuclear whorls one and one-half, forming a moderately elevated helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-third immersed. Post-nuclear whorls moderately rounded, somewhat contracted at the sutures, strongly tabulated on the summits, marked by rounded, weak, axial ribs of which 8 occur upon the first and second, 10 upon the third, 12 upon the fourth and fifth, and 14 upon the penultimate turn. Intercostal spaces broad and shallow. Periphery of the last whorl and base well rounded, marked by the continuation of the ribs. Aperture broadly oval; outer lip thin; columella slender, slightly curved.

De Folin's type comes from Isle of Pearls, Bay of Panama. It has seven post-nuclear whorls, and measures: Length 2.5 mm., diameter 1.2 mm.

ODOSTOMIA (SALASSIA) SCALARIFORMIS Carpenter.

Plate 13, fig. 1.

Parthenia scalariformis CARPENTER, Cat. Maz. Shells, 1856, p. 413.

Shell pupiform, white. Nuclear whorls small, almost completely immersed. Post-nuclear whorls well rounded, scarcely at all contracted at the periphery, strongly roundedly shouldered at the summit, marked by slender, distant, scalariform, retractive axial ribs, of which about 20 occur upon the first and 16 upon the remaining turns. Intercostal spaces very broad, shallow. Sutures strongly marked. Periphery and the somewhat prolonged base of the last whorl well rounded, marked by the undiminished continuations of the axial ribs, which extend to the umbilical chink. Aperture ovate; outer lip thin; columella slender, curved, provided with a moderately strong fold at its insertion; parietal wall covered with a thick callus.

Two specimens of this species were found on *Chama* at Mazatlan. Tablet 1962 of the Liverpool collection in the British Museum contains the finest of the two. This has six post-nuclear whorls, and measures: Length 5 mm., diameter 0.93 mm.

Subgenus BESLA Dall and Bartsch.

Besla DALL and BARTSCH, Proc. Biol. Soc. Wash., vol. 17, 1904, p. 10.

Small *Odostomias* with axial ribs and three strong spiral raised threads, one at and two posterior to the periphery between the sutures; base marked by raised spiral threads.

Type.—*Chrysallida convexa* Carpenter.

KEY TO THE SPECIES OF THE SUBGENUS BESLA.

Whorls overhanging...*convexa*, p. 135.
Whorls flattened...*callimorpha*, p. 136.

ODOSTOMIA (BESLA) CONVEXA Carpenter.

Plate 13, fig. 4.

Chrysallida convexa CARPENTER, Cat. Mazatlan Shells, 1856, p. 424.

Shell small, slender, elongate-conic. Nuclear whorls two and one-half, forming a moderately elevated helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Post-nuclear whorls overhanging, strongly contracted at the sutures, appressed at the summit, angulated at the posterior extremity of the anterior third; between the sutures, marked by strong, rounded, sinuous, almost vertical axial ribs, of which 16 occur upon the second and third, 18 upon the fourth, and 22 upon the penultimate turn. Intercostal spaces a little more than twice as wide as the ribs, crossed by three equal and equally spaced spiral cords, which are about one-half as strong as the ribs. The first of these cords is at the periphery, the third at the posterior termination of the anterior third between the sutures, which it renders strongly angulated. Sutures constricted. Periphery and base of the last whorl well rounded, marked by the continuation of the axial ribs, and about eight slender spiral lirations. Aperture broadly oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, slightly curved, decidedly oblique and revolute, provided with a slender fold at its insertion; parietal wall covered with a strong callus.

Two specimens (Cat. no. 162734, U.S.N.M.) were dredged at U. S. Bureau of Fisheries station 2823, in 26 fathoms, on broken shell bottom, off Cacachitas, Gulf of California. The larger of the two specimens has six post-nuclear whorls and measures: Length 2.4 mm., diameter 0.7 mm.

The type which is on tablet 1984, Liverpool collection, British Museum, and another specimen were collected on *Spondylus* at Mazatlan.

ODOSTOMIA (BESLA) CALLIMORPHA, new name.

Plate 13, fig. 5.

Chrysallida pumila Carpenter, Proc. Cal. Acad. Sci., vol. 3, 1866, p. 219; not *Odostomia pumila* A. Adams, 1861.

Shell very small, pupiform, milk-white. Nuclear whorls completely immersed. Post-nuclear whorls flattened, slightly contracted at the sutures, moderately shouldered at the summit, marked by strong, depressed, rounded, almost vertical axial ribs, of which 22 occur upon all but the first whorl, which is smooth. Intercostal spaces about as wide as the ribs, crossed by three slender, spiral lirations on the anterior half of the whorls between the sutures. Sutures subchanneled. Periphery and base of the last whorl well rounded, marked by the continuations of the axial ribs, which extend almost undiminished to the umbilical area and five equal slender, spiral lirations on the posterior half of the base. Aperture broadly oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella strongly curved, slightly revolute, reënforced on its posterior half by the base, provided with a strong fold at its insertion.

The type (Cat. no. 15565, U.S.N.M.) comes from San Pedro, California. It has five post-nuclear whorls and measures: Length 1.5 mm., diameter 0.6 mm.

Subgenus CHRYSALLIDA Carpenter.

Chrysallida Carpenter, Cat. Mazatlan Shells, 1856, p. 416.=*Noëmia* De Folin, Fonds de la Mer, 1873, p. 314. Type.—*Noëmia angusta* De Folin; *Noëmiamea* De Folin, Zool. Rec., 1885, p. 94 (Mollusca). Same type. Not *Noëmia* Pasco, 1857.

Odostomias having strong axial ribs crossed by equally strong spiral keels between the sutures, the intersection of these two elements forming nodules. The axial ribs pass only faintly over the base, while the spiral sculpture remains quite prominent.

Type.—Odostomia (*Chrysallida*) *torrita* n. n. = *Chrysallida communis* Carpenter; not *Chemnitzia* [= *Chrysallida*] *communis* C. B. Adams.

KEY TO THE SPECIES OF THE SUBGENUS CHRYSALLIDA.

- All spiral cords between the sutures nodulose.
  - Sutures strongly channeled.
    - Axial ribs always stronger than the spiral cords.
      - Basal cords 5 .... *reigeni*, p. 138.
      - Basal cords 6 .... *inconspicua*, p. 139.
      - Basal cords 7 .... *telescopium*, p. 139.
      - Basal cords 8 .... *excelsa*, p. 140.
      - Basal cords 9 .... *acrybia*, p. 141.
      - Basal cords 10 .... *communis*, p. 141.
      - Basal cords 12.
        - Outer lip of adult shell pinched in .... *torrita*, p. 142.
        - Outer lip of adult shell not pinched in.
          - Axial ribs of last whorl 16 .... *licina*, p. 143.
          - Axial ribs of last whorl 22 .... *talama*, p. 143.
    - Axial ribs not as strong as the spiral cords.
      - Spiral cords 4 between the sutures on the later whorls.
        - Shell slender, elongate-conic.
          - Basal cords 8.
            - Diameter more than 1 mm .... *effusa*, p. 144.
            - Diameter less than 1 mm .... *paupercula*, p. 144.
          - Basal cords 7 .... *clathratula*, p. 145.
          - Basal cords 6.
            - Adult shell 4.5 mm. long .... *ritteri*, p. 146.
            - Adult shell 2.3 mm. long .... *rinella*, p. 146.
          - Basal cords 5 .... *eugena*, p. 147.
        - Shell ovate or broadly conic.
          - Basal cords 4 .... *trachis*, p. 148.
          - Basal cords 5.
            - Shell large, adult 4.0 mm. long .... *lucca*, p. 148.
            - Shell small, adult 2.3 mm. long .... *clementina*, p. 149.
          - Basal cords 6.
            - Outer lip of adult shell decidedly pinched in . *oonisca*, p. 150.
            - Outer lip of adult shell not pinched in.
              - Whorls slopingly shouldered .... *oldroydi*, p. 150.
              - Whorls not shouldered.
                - Axial ribs decidedly retractive ...... *nodosa*, p. 151.
                  - Nodules round .... *ovata*, p. 152.
                  - Nodules oval .... *cincta*, p. 152.
          - Basal cords 7.
            - Base of the last whorl strongly inflated ...... *loomisi*, p. 153.
            - Base of the last whorl somewhat excavated.
              - Spaces between the spiral cords mere impressed lines. *ricola*, p. 153.
              - Spaces between the spiral cords broad, deep channels. *astricta*, p. 154.
          - Basal cords 8 .... *cooperi*, p. 155.
          - Basal cords 9 .... *hipolitensis*, p. 155.
        - Spiral cords 5 between the sutures of the later whorls . *lapazana*, p. 156.
        - Spiral cords 6 between the sutures of the later whorls . *proxima*, p. 157.

- All spiral cords between the sutures nodulose—Continued.
  - Sutures not channeled.
    - Axial ribs always stronger than the spiral cords .... *tyleri*, p. 157.
    - Axial ribs not as strong as the spiral cords.
      - Spiral cords 4 between the sutures.
        - Adult shell more than 5 mm. long .... *scammonensis*, p. 158.
        - Adult shell 3 or less mm. long.
          - Basal cords 4 .... *pulchra*, p. 158.
          - Basal cords 6.
            - Spaces between the spiral cords deep, broad channels. *montereyensis*, p. 159.
            - Spaces between the spiral cords mere impressed lines. *pulcia*, p. 160.
          - Basal cords 10 or more .... *virginalis*, p. 160.
      - Spiral cords 5 between the sutures .... *defolinia*, p. 161.
      - Spiral cords more than 5 between the sutures.
        - Basal cords 6 .... *oregonensis*, p. 162.
        - Basal cords 10 or more .... *virginalis*, p. 160.
- All spiral cords between the sutures not nodulose.
  - Anterior spiral cord between the sutures smooth and wholly exposed, the rest nodulose.
    - Nodulous spiral cords 4 between the sutures.
      - Shell large, adult more than 4.5 mm. long .... *benthina*, p. 163.
      - Shell small, adult less than 3 mm. long .... *promeces*, p. 164.
    - Nodulose spiral cords 3 between the sutures.
      - Shell large, adult 5 mm. long .... *pulcherrima*, p. 164.
      - Shell small, adult less than 3 mm. long.
        - Basal cords 5 .... *vincta*, p. 165.
        - Basal cords 6 .... *fasciata*, p. 165.
  - Anterior half of the whorls between the sutures usually not nodulous, the rest strongly so .... *virginalis*, p. 160.
    - Early whorls and frequently only the posterior part of these nodulose.
      - Shell long, adult more than 4 mm. long .... *helga*, p. 166.
      - Shell small, adult less than 3 mm. long.
        - Base decidedly attenuated anteriorly .... *sanctorum*, p. 167.
        - Base not strongly attenuated.
          - Spiral cords 6 between the sutures .... *sapia*, p. 167.
          - Spiral cords less than 6 between the sutures.
            - Spiral cords very strong .... *rotundata*, p. 168.
            - Spiral cords almost obsolete .... *deceptrix*, p. 169.

ODOSTOMIA (CHRYSALLIDA) REIGENI Carpenter.

Plate 13, fig. 7.

Chrysallida reigeni Carpenter, Cat. Mazatlan Shells, 1856, p. 422.

Shell elongate-ovate. Nuclear whorls smooth, deeply immersed in the first of the succeeding turns. Post-nuclear whorls flattened, strongly contracted at the sutures and well shouldered at the summit, marked by strong axial ribs of which 18 occur upon the first and 20 upon the second and penultimate turn. In addition to the axial ribs, the intercostal spaces, which equal the ribs in width, are marked by four slender spiral cords between the sutures, which pass up on the sides of the ribs but do not cross their summits. The spaces between the ribs and cords are well impressed, round pits. Sutures channeled. Periphery of the last whorl marked by a groove. Base well rounded, marked by five subequal and equally spaced spiral cords, the spaces between which are crossed by slender axial threads. Aperture pyriform, posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, provided with an oblique fold at the insertion; parietal wall covered with a thin callus.

Tablet 1979, Liverpool collection, British Museum, contains the type which was taken off *Spondylus* at Mazatlan, Mexico. It has four post-nuclear whorls and measures: Length 1.4 mm., diameter 0.7 mm.

ODOSTOMIA (CHRYSALLIDA) INCONSPICUA C. B. Adams.

Plate 14, fig. 3.

Cingula inconspicua C. B. Adams, Ann. Lyc. Nat. Hist. of N. Y., vol. 5, 1852, p. 405.

Shell ovoid, milk-white. Nuclear whorls deeply, obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects, which is smooth. Post-nuclear whorls very slightly rounded, ornamented by strong axial ribs, of which 18 occur upon the second and third and 20 upon the penultimate turn. In addition to the axial ribs the whorls are marked by four equal and equally spaced slender spiral cords, which are a little less strong than the ribs, and render the junction with these nodulous. Sutures channeled; periphery and base of the last whorl well rounded, the latter marked by six equal spiral cords, which are about as wide as the spaces that separate them. The impressed grooves are crossed by numerous slender axial threads. Aperture ovate; posterior angle obtuse; outer lip thin, pinched in in the middle; columella slender, moderately curved, slightly reflected, partly reënforced by the base. Parietal wall covered with a strong callus, which renders the peritreme complete.

The type is at Amherst College, and was collected by Prof. C. B. Adams at Panama Bay. It has five post-nuclear whorls and measures: Length 1.5 mm., diameter 0.6 mm.

ODOSTOMIA (CHRYSALLIDA) TELESCOPIUM Carpenter.

Plate 13, fig. 9.

Chrysallida telescopium Carpenter, Cat. Mazatlan Shells, 1856, pp. 421, 422.

Shell very elongate-conic, white. Nuclear whorls two, forming a moderately elevated helicoid spire which is about one-half obliquely immersed in the first of the succeeding turns. Post-nuclear whorls almost flattened, strongly contracted at the suture and strongly shouldered at the summit, marked by strong, vertical, axial ribs, of which 18 occur upon the first, 22 upon the second, 20 upon the third, 22 upon the fourth and penultimate turn. In addition to the axial ribs the whorls are marked by four slender, spiral cords which do not render the ribs tuberculate. The spaces between the cords and the ribs are deep round pits. Sutures channeled. Periphery of the last whorl marked by a groove. Base somewhat attenuated anteriorly, well rounded posteriorly, marked by seven spiral cords which become somewhat diminished in size from the periphery to the umbilical region. Grooves separating the cords marked by numerous slender axial threads. Aperture irregularly pyriform, effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; columella moderately stout, reflected, reënforced by the base, provided with a fold at its insertion; parietal wall covered with a thin callus.

Ten specimens (mostly young) off *Chama* and *Spondylus*, Liverpool collection, British Museum, were taken at Mazatlan, Mexico. Tablet 1978 contains three specimens, the largest of which has six post-nuclear whorls and measures: Length 3.1 mm., diameter 0.9 mm.

ODOSTOMIA (CHRYSALLIDA) EXCELSA, new species.

Plate 14, fig. 11.

Shell broadly conic, white. Nuclear whorls smooth, almost completely obliquely immersed in the first of the succeeding turns, above which the tilted edge of the last whorl only projects. Post-nuclear whorls flattened, strongly contracted at the sutures and somewhat shouldered at the summit, marked by strong protractive axial ribs, of which 16 occur upon the second, 18 upon the third, and 20 upon the remaining turns. In addition to the axial ribs the whorls are marked by four slender spiral cords between the sutures, which render the ribs tuberculate at their junction, the spaces inclosed by the ribs and spiral cords are deep, quadrangular pits, the long axis of which coincides with the spiral cords. Periphery of the last whorl marked by a strong sulcus which is crossed by the continuation of the axial ribs. Base of the last whorl attenuated, well rounded, marked by eight subequal and subequally spaced low spiral cords, the grooves between which are crossed by many slender axial threads. The summit of the last whorl falls below the first basal keel and leaves this in the suture. On the last half of the last turn, an additional slender spiral thread divides the space between the first and second and second and third strong spiral cords. Aperture pyriform, somewhat effuse anteriorly; posterior angle obtuse; outer lip (fractured), thin, showing the external sculpture within; columella strong, curved, decidedly reflected over the reënforcing base, provided with a strong fold at its insertion; parietal wall covered with a strong callus which renders the peritreme complete.

The type (Cat. no. 206894, U.S.N.M.) comes from the Bay of Panama. It has seven post-nuclear whorls and measures: Length 3.3 mm., diameter 1.3 mm.

ODOSTOMIA (CHRYSALLIDA) ACRYBIA, new species.

Plate 14, fig. 6.

Shell elongate-conic, milk-white. (Nuclear whorls decollated.) Post-nuclear whorls very slightly rounded, somewhat contracted at the sutures, feebly shouldered at the summits, marked by strong, almost vertical axial ribs, of which 14 occur upon the second, 16 upon the third, 18 upon the fourth, 20 upon the fifth, and 22 upon the penultimate turn. Intercostal spaces a little wider than the ribs, crossed by four slender spiral cords, the junction of which with the ribs renders them feebly nodulous. Sutures strongly impressed but not channeled. Periphery and base of the last whorl well rounded, the latter marked by nine slender spiral cords, the spaces between which are crossed by fine axial threads. Aperture oval, slightly effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; columella twisted, decidedly reflected anteriorly, provided with a strong fold at its insertion; parietal wall covered with a thick callus.

The type (Cat. no. 206895, U.S.N.M.) comes from Point Abreojos, Lower California. It has seven post-nuclear whorls and measures: Length 3.2 mm., diameter 1.2 mm. Another specimen from the same locality is in Mr. Hemphill's collection.

ODOSTOMIA (CHRYSALLIDA) COMMUNIS C. B. Adams.

Plate 14, figs. 10, 10*a*.

Chemnitzia communis C. B. Adams, Ann. Lyc. Nat. Hist. of N. Y., vol. 5, 1852, p. 390.

Shell conic, vitreous to milk-white. Nuclear whorls at least two, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-half immersed. Post-nuclear whorls flattened, strongly contracted at the suture and decidedly shouldered at the summit, marked by strong vertical axial ribs of which there are 16 upon the first and second, 18 upon the third to fifth, and 20 upon the penultimate turn. In addition to the ribs the whorls are marked by four spiral cords about one-half as strong as the ribs, between the sutures; the first of these is at the angle of the shoulder. The junction of the spiral cords and ribs nodulous; the spaces inclosed between them rectangular pits. Sutures channeled. Periphery of the last whorl marked by a spiral cord at whose posterior margin the axial ribs terminate. Base produced, moderately rounded, marked by ten spiral cords, which, like the grooves separating them, decrease regularly in size from the periphery to the umbilical area. The grooves on the base are crossed by numerous slender axial threads. Aperture pyriform, somewhat effuse anteriorly; channeled at the posterior angle, which is obtuse; outer lip thin, decidedly arched in the middle, flattened on the side, showing the external sculpture within; columella stout, reflected very much anteriorly; provided with a strong fold at its insertion; parietal wall covered with a thick callus.

Professor Adams collected 90 specimens in the Bay of Panama, which he listed under this species; 28 of these are in the Amherst collection which belong to three species. We have taken the finest for our description and figure of *Odostomia* (*Chrysallida*) *communis*, of which there are 15 specimens. The specimen described and figured has seven post-nuclear whorls and measures: Length 3.2 mm., diameter 1.2 mm.

ODOSTOMIA (CHRYSALLIDA) TORRITA, new species.

Plate 14, fig. 2.

Chrysallida communis (C. B. Adams) Carpenter, Cat. Mazatlan Shells, 1856, pp. 419, 420; not *Chemnitzia communis* C. B. Adams, Ann. Lyc. Nat. Hist. of N. Y., vol. 5, 1852, p. 390=*Odostomia* (*Chrysallida*) *communis* [C. B. Adams].

Shell small, very elongate-ovate, vitreous. Nuclear whorls smooth, deeply obliquely immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects. Post-nuclear whorls slightly rounded, moderately contracted at the periphery and well shouldered at the summit, marked by strong axial ribs, of which about 20 occur upon all the whorls. Intercostal spaces about as wide as the ribs, marked between the sutures by four slender spiral cords which pass up on the sides of the ribs but do not cross their summits. On the last whorl the first basal keel falls between the sutures; here, too, the ribs are rendered slightly tuberculate by the spiral cords. Sutures strongly marked but not channeled. Periphery of the last whorl marked by a groove. Base somewhat produced, marked by twelve slender, spiral cords which are a little wider than the spaces that separate them and become successively narrower and more closely spaced from the periphery to the umbilical area. The spaces between the cords are marked by numerous slender, axial threads. Aperture pyriform, slightly effuse anteriorly; posterior angle acute; outer lip pinched in posteriorly; thin, showing the external sculpture within; columella stout, strongly reflected anteriorly, reënforced by the base, provided with a weak fold at its insertion; parietal wall covered with a strong callus.

The type and four specimens are part of the 500 specimens of this species found on *Chama* and *Spondylus* at Mazatlan, Mexico.

The type has five and one-half post-nuclear whorls and measures: Length 2 mm., diameter 0.8 mm.

ODOSTOMIA (CHRYSALLIDA) LICINA, new species.

Plate 14, fig. 9.

Shell pupiform, vitreous. Nuclear whorls large, obliquely immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects. Post-nuclear whorls flattened, slightly excurved at the shouldered summit, strongly contracted at the sutures, marked by very strong, vertical axial ribs, of which 16 occur upon all the whorls. In addition to these ribs, the whorls are marked between the sutures by four moderately strong spiral cords, which render the junction with the ribs obscurely nodulous. The spaces inclosed between the ribs and cords are well impressed squarish pits. Sutures strongly impressed. Periphery and base of the last whorl well rounded, marked by the feeble continuations of the axial ribs and twelve slender spiral cords which grow successively weaker from the periphery to the umbilical area. Aperture elongate, oval; posterior angle obtuse, outer lip thin, showing the external sculpture within; columella slender, decidedly curved, slightly reflected, reënforced by the base, provided with a weak fold at its insertion; parietal wall covered with a thin callus.

The type and another specimen (Cat. no. 106500, U.S.N.M.) were collected at Manuel Lagoon, Lower California. The type has six post-nuclear whorls and measures: Length 3 mm., diameter 1.2 mm.

ODOSTOMIA (CHRYSALLIDA) TALAMA, new species.

Plate 18, fig. 6.

Shell conic, vitreous. Nuclear whorls small, smooth, obliquely deeply immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls flattened, strongly contracted at the periphery and moderately shouldered at the summit, marked by moderately strong, almost vertical, axial ribs, of which 16 occur upon the second and third, 18 upon the fourth, 20 upon the fifth, and 22 upon the penultimate turn. In addition to the axial ribs, the whorls are marked by four slender spiral cords between the sutures, the junction of which, with the axial ribs, renders them feebly nodulous. The spaces inclosed by the ribs and cords are well impressed squarish pits. Sutures strongly channeled. Periphery marked by a slender spiral cord, on the posterior edge of which the axial ribs terminate. Base of the last whorl well rounded, slightly attenuated anteriorly, marked by twelve spiral cords which grow successively weaker from the periphery to the umbilical area. Aperture oval, posterior angle acute, outer lip thin, showing the external sculpture within, rendered sinuous by the spiral cords; columella slender, slightly reflected and reënforced by the base; provided with a slender fold at its insertion.

The type and three specimens (Cat. no. 106518, U.S.N.M.) come from Scammon Lagoon, Lower California. The type has six post-nuclear whorls and measures: Length 3.4 mm., diameter 1.3 mm.

ODOSTOMIA (CHRYSALLIDA) EFFUSA Carpenter.

Plate 14, figs. 5, 5*a*.

Chrysallida effusa CARPENTER, Cat. Mazatlan Shells, 1856, p. 422.

Shell elongate-conic, vitreous. Nuclear whorls small, smooth, almost completely obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls flattened, strongly contracted at the sutures and moderately shouldered at the summit, marked by strong, tuberculate retractive axial ribs, of which 18 occur upon the first and second and 20 upon the remaining turns. In addition to these axial ribs the whorls are marked by four slender, spiral cords between the sutures, which pass over the axial ribs and render them tuberculate at their junction. The spaces inclosed by the ribs and cords are rectangular pits, which have their long axis parallel with the spiral cords. Sutures channeled. Periphery of the last whorl marked by a spiral groove. Base of the last whorl well rounded, marked by eight spiral cords which grow successively weaker and closer spaced from the periphery to the umbilical area. The wide grooves between the spiral cords are marked by slender, raised, axial threads, which correspond to the ribs on the spire. Aperture ovate, somewhat effuse anteriorly; posterior angle obtuse, outer lip thin, showing the external markings within; columella stout, strongly reflected, provided with a slender fold at its insertion; parietal wall covered by a strong callus.

The type, which is on tablet 1980, Liverpool collection, British Museum, came off *Chama* at Mazatlan, Mexico. The specimen described and figured (no. 16194, U.S.N.M.) was collected by J. Xantus, at Cape St. Lucas, Lower California. It has six post-nuclear whorls and measures: Length 2.8 mm., diameter 1.2 mm.

ODOSTOMIA (CHRYSALLIDA) PAUPERCULA C. B. Adams.

Plate 14, fig. 4.

Cingula (?) *paupercula* C. B. ADAMS, Ann. Lyc. Nat. Hist. of N. Y., vol. 5, 1852, pp. 405, 406.

Shell very elongate, conic, bluish-white. Nuclear whorls two, smooth, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about half immersed. Post-nuclear whorls moderately rounded, slightly shouldered at the summit, somewhat contracted at the sutures, marked by four strong spiral cords and axial ribs, which are a little less strong than the cords; 18 of the ribs occur upon the first, 16 upon the second to fifth, 20 upon the sixth, and 34 upon the penultimate turn. The junctions of the ribs and spiral cords form moderately strong tubercles, while the spaces inclosed between them appear as almost circular, well-impressed pits. Periphery of the last whorl marked by a spiral keel a little less strong than those between the sutures. Base well rounded, somewhat attenuated anteriorly; marked by five almost equal and equally spaced spiral cords and two very slender lirations, the latter near the columella. The deep grooves between the spiral cords are marked by numerous slender axial lirations. Sutures subchanneled. Aperture irregular, somewhat channeled anteriorly. Posterior angle obtuse, outer lip thin, rendered sinuous by the spiral cords. Columella slender, sigmoid, reënforced by the base, provided with a strong, deep-seated fold at its insertion. Parietal wall covered with a faint callus.

Prof. C. B. Adams's type is at Amherst College, and was collected in the Bay of Panama. It has eight post-nuclear whorls and measures: Length 3.3 mm., diameter 0.9 mm.

ODOSTOMIA (CHRYSALLIDA) CLATHRATULA C. B. Adams.

Plate 14, figs. 7, *7a*.

Chemnitzia clathratula C. B. Adams, Ann. Lyc. Nat. Hist. N. Y., vol. 5, 1852, pp. 389, 390.

Shell elongate-conic, slender, vitreous. Nuclear whorls two and one-half, forming a depressed helicoid spire, whose axis is almost at right angles to that of the succeeding turns, in the first of which it is about one-half immersed. Post-nuclear whorls very slightly rounded, strongly constricted at the sutures and prominently shouldered at the summit, marked by well rounded, tuberculate, axial ribs, of which 14 occur upon the first and second, 16 upon the third, 18 upon the fourth and fifth, and 24 upon the penultimate turn. In addition to the axial ribs, the whorls are marked between the sutures by four spiral cords which equal the ribs in strength, and render them tuberculate at their junction. Sutures broadly and deeply channeled. Periphery and the somewhat prolonged base of the last whorl well rounded, the latter marked by seven narrow, almost equal, and equally spaced spiral keels, the broad space between which and the peripheral sulcus are marked by many slender axial riblets. Aperture oval; outer lip (fractured anteriorly) thin, showing the external sculpture within; columella stout, slightly curved, strongly reflected over the reënforcing base, provided with a strong fold at its insertion.

Professor Adams states that ten specimens in various stages of growth were collected in the sand of the Bay of Panama; two of these are in the collection at Amherst College.

We have figured the better of the two individuals which has seven post-nuclear whorls and measures: Length 2.8 mm., diameter 0.9 mm.

ODOSTOMIA (CHRYSALLIDA) RITTERI, new species.

Plate 14, figs. 8, 8*a*.

Shell elongate-conic, milk-white. Nuclear whorls at least two, smooth, deeply obliquely immersed in the first of the succeeding turns, above which only a portion of the last two turns project. Post-nuclear whorls moderately rounded, strongly constricted at the sutures, slopingly shouldered at the summit, ornamented by strong, retractive axial ribs of which 14 occur upon the first, 16 upon the second to fourth, 18 upon the fifth, and 20 upon the penultimate turn. In addition to the axial ribs, the whorls are marked by spiral cords between the sutures, which are a little more than half as strong as the ribs and of which three occur upon the first three whorls and four upon the succeeding turns; the second one below the summit marking the angle of the long sloping shoulder. Junction of ribs and cords strongly nodulous; the spaces inclosed between them are deep squarish pits. Sutures strongly channeled. Periphery of the last whorl marked by a broad groove that is crossed by the continuations of the axial ribs which terminate at the posterior margin of the first basal keel. Base of the last whorl well rounded, marked by six spiral cords which are of unequal strength, separated by grooves of different widths, which are crossed by fine axial threads. Aperture oval, effuse anteriorly; posterior angle obtuse; outer lip rendered sinuous by the cords, thin, showing the external sculpture within; columella slender, strongly reflected, provided with a fold at its insertion.

The type (Cat. no. 206896, U.S.N.M.) was dredged at station 30, University of California, off Catalina Island. It has seven post-nuclear whorls and measures: Length 4.5 mm., diameter 1.6 mm. Four topotypes are in the collection of the University of California, which has the following additional specimens: Four from station 47, off San Diego; three from station 59; and two from station 83, also from off San Diego. Cat. no. 206897, U.S.N.M., one dredged in 50 fathoms, off Catalina Island.

Named for Prof. W. E. Ritter.

ODOSTOMIA (CHRYSALLIDA) RINELLA, new species.

Plate 15, figs. 6, 6*a*.

Shell elongate-ovate, cream-colored. Nuclear whorls at least two, smooth, forming a depressed helicoid spire, which is obliquely three-fifths immersed in the first of the succeeding turns. Post-nuclear whorls moderately rounded, strongly contracted at the sutures, somewhat shouldered at the summits, marked by strong, tuberculated axial ribs and four spiral cords almost as strong as the ribs between the sutures which renders their junction with the ribs tuberculate. Of the ribs which are slightly protractive, 17 appear upon the first to third and 19 upon the penultimate whorl. Sutures strongly channeled. Periphery of the last whorl marked by a sulcus which is crossed by the continuation of the axial ribs. Base moderately long, well rounded, marked by six slender spiral threads, the axial sculpture being reduced to mere lines of growth. Aperture oval; posterior angle obtuse; outer lip thin; columella oblique, almost straight, decidedly revolute, marked with a strong fold at its insertion.

The type (Cat. no. 162781, U.S.N.M.) comes from the Bay of Panama. It has five post-nuclear whorls and measures: Length 2.3 mm., diameter 1.1 mm.

ODOSTOMIA (CHRYSALLIDA) EUGENA, new species.

Plate 14, figs. 1, 1*a*.

Shell elongate-conic, milk-white. Nuclear whorls at least two, small, smooth, obliquely half immersed in the first of the succeeding turns. Post-nuclear whorls well rounded, moderately contracted at the suture, well shouldered at the summit, marked by strong, very retractive axial ribs, of which 14 occur upon the first, 16 upon the second, 18 upon the third to fifth, and 22 upon the penultimate whorl. In addition to these ribs the whorls are marked by four strong spiral cords between the sutures which render their junction with the ribs tuberculate. The spaces inclosed by the ribs and cords form oval pits, the long axis of which coincides with the spiral sculpture. Sutures channeled. Periphery of the last whorl marked by a moderately broad groove, which is crossed by the continuation of the axial ribs which terminate at the posterior edge of the first basal keel. Base of the last whorl well rounded, marked by six spiral keels which grow successively weaker from the periphery to the umbilical region. The broad spaces between these keels are crossed by slender, raised axial threads. Aperture oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella stout, curved, strongly reflected and reënforced by the base, provided with a strong fold at its insertion.

The type and three specimens (Cat. no.127545, U.S.N.M.) comes from San Hipolito Point, Lower California. The type has seven and one-half post-nuclear whorls and measures: Length 4.3 mm., diameter 1.5 mm. Cat. no. 168566, U.S.N.M., one specimen from San Pedro. Two specimens were identified from the same region for Mr. Berry. Cat. no. 168567, U.S.N.M, one specimen from San Diego. Another from the foot of Ash street, San Diego, was identified for Mrs. Oldroyd.

ODOSTOMIA (CHRYSALLIDA) TRACHIS, new species.

Plate 15, figs. 4, 4*a*.

Shell small, elongate-conic. Nuclear whorls small, smooth, strongly obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, strongly contracted at the sutures, slopingly shouldered at the summit, marked by strong, rounded, decidedly retractive axial ribs, of which 16 occur upon the second, 18 upon the third, and 20 upon the penultimate turn. In addition to the axial ribs the whorls are crossed between the sutures by four spiral cords, which are as strong as the ribs and render them nodulous at their junction. The second of these cords below the summit marks the angle of the shoulder. The spaces inclosed by the ribs and cords are deep, squarish pits. Sutures subchanneled. Periphery of the last whorl marked by a groove, crossed by the spiral ribs, which terminate at the extremity of the first basal cord. Base well rounded, marked by four subequal, distantly spaced, narrow, spiral cords, the broad spaces between which are crossed by numerous axial threads. Aperture oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, reflected, reënforced by the base, provided with a fold at its insertion; parietal wall covered with a thin callus.

The type (Cat. no. 168619, U.S.N.M.) comes from San Pedro, California. It has five post-nuclear whorls and measures: Length 2.5 mm., diameter 1 mm.

ODOSTOMIA (CHRYSALLIDA) LUCCA, new species.

Plate 15, figs. 8, 8*a*.

Shell broadly conic, milk-white. Nuclear whorls large, obliquely immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects, which shows five strong spiral threads. Post-nuclear whorls well rounded, strongly contracted at the sutures, appressed at the summits with a sloping shoulder that extends from the summit to the second spiral keel, marked by narrow decidedly elevated, retractive axial ribs, of which 16 occur upon the first and second, 18 upon the third, and 22 upon the penultimate turn. In addition to the ribs, the whorls are marked between the sutures by four spiral keels, which equal the ribs in strength and render them decidedly nodulous at their junction. The spaces inclosed by the ribs and cords are well impressed rectangular pits whose axis coincides with the spiral sculpture. Sutures subchanneled, showing a portion of the first basal keel in the last two volutions. Periphery of the last whorl marked by a broad channel, crossed by the axial ribs which terminate at the posterior edge of the first basal keel. Base of the last whorl well rounded, marked by five subequal and subequally spaced spiral lirations, separated by broad spaces which are marked by numerous prominent axial threads. Aperture broadly oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella moderately strong, curved, reënforced by the base, provided with a weak fold at its insertion; parietal wall covered with a thin callus.

The type (Cat. no. 206898, U.S.N.M.) comes from San Diego. It has five post-nuclear whorls and measures: Length 4 mm., diameter 1.4 mm. The University of California has one specimen from station 30, off Santa Catalina Island, and four from station 47, off San Diego.

This species is closely allied to *Odostomia* (*Chrysallida*) *oldroydi.* It differs in having a comparatively larger nucleus which is more prominently sculptured, in being more attenuated and having more slender ribs and spiral cords and in having the axial sculpture on the base much stronger. It is likewise much smaller.

ODOSTOMIA (CHRYSALLIDA) CLEMENTINA, new species.

Plate 15, figs. 5, *5a*.

Shell elongate-conic, vitreous. Nuclear whorls obliquely immersed in the first post-nuclear turn, above which only the tilted edge of the last volution projects, which is marked by five slender spiral threads. Post-nuclear whorls well rounded, moderately contracted at the sutures, strongly slopingly shouldered at the summit, marked by strong, somewhat retractive axial ribs, of which 14 occur upon the first and second, 18 upon the third and the penultimate turn. In addition to the axial ribs, the whorls are marked by four spiral cords between the sutures, of which the second one anterior to the summit marks the angle of the shoulder. On the last two whorls the first basal is apparent in the strongly contracted sutures. Periphery of the last whorl marked by a spiral groove. Base well rounded, somewhat attenuated anteriorly, marked by five distant spiral cords which grow successively weaker from the periphery to the umbilical region. The broad spaces that separate these cords are marked by numerous fine, raised, axial threads. Aperture broadly oval; posterior angle obtuse; outer lip thin, showing the external sculpture within, rendered sinuous by the spiral cords; columella moderately strong, slightly reflected, reënforced by the base, provided with a slender fold at its insertion.

The type (Cat. no. 162043, U.S.N.M.) comes from San Clemente Island, California. It has five post-nuclear whorls and measures: Length 2.3 mm., diameter 1.1 mm.

ODOSTOMIA (CHRYSALLIDA) OONISCA, new name.

Plate 15, fig. 3.

Chrysallida ovulum Carpenter, Cat. Maz. Shells, 1856, pp. 423, 424; not *Pasithea* (=*Odostomia*) *ovulum* Lea, 1845.

Shell ovate, white. Nuclear whorls deeply obliquely immersed in the first post-nuclear whorl above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, strongly contracted at the sutures, moderately shouldered at the summit, marked by the moderately strong, tuberculate, slightly retractive axial ribs, of which 16 occur upon the second and 18 upon the third and penultimate turn. In addition to the axial ribs the whorls are marked by four spiral cords between the sutures which are a little less strong than the axial ribs and render them nodulous at their junction. The spaces inclosed by the ribs and spiral cords are deep round pits. Sutures channeled. Periphery of the last whorl marked by a groove. Base well rounded, marked by six strong, spiral cords which decrease successively in size and spacing from the periphery to the umbilicus. Grooves between the spiral cords marked by slender threads corresponding to the axial ribs. Aperture irregularly pyriform, posterior angle acute; outer lip pinched in posteriorly, thin, showing the external sculpture within; columella slender, slightly reflected, provided with a fold at its insertion; parietal wall covered with a thin callus.

Tablet 1982, Liverpool collection, British Museum, contains nine specimens taken from *Spondylus* and *Chama* at Mazatlan, Mexico. A specimen of four whorls measures: Length 1.4 mm., diameter 0.7 mm.

ODOSTOMIA (CHRYSALLIDA) OLDROYDI, new species.

Plate 15, figs. 1, 1*a*.

Shell elongate-ovate, vitreous. Nuclear whorls small, obliquely immersed in the first of the succeeding turns, above which projects the tilted edge which is marked with five raised spiral lirations. Post-nuclear whorls somewhat inflated, well rounded, moderately contracted at the sutures, strongly slopingly shouldered at the summit, ornamented with somewhat retractive axial ribs, of which 14 occur upon the first, 16 upon the second, 18 upon the third, and 20 upon the penultimate turn. In addition to the axial ribs, the whorls are marked by four spiral cords between the sutures which are as strong as the ribs and render them strongly nodulous at their junction. The second of these ribs below the summit marks the angle of the shoulder. The spaces inclosed by the ribs and cords are strongly impressed oblong pits, the long axis of which coincides with the spiral sculpture. Sutures strongly constricted. Periphery of the last whorl marked by a spiral groove, crossed by the continuations of the axial ribs, which terminate at the posterior edge of the first basal keel. Base well rounded posteriorly, somewhat attenuated anteriorly, marked by six almost equal spiral keels, which are less developed about the umbilical area. The deep grooves between these keels are crossed by numerous very slender, raised axial threads. Aperture oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; rendered decidedly sinuous by the spiral cords; columella moderately strong, decidedly reflected anteriorly, provided with a fold at its insertion.

The type (Cat. no. 162765, U.S.N.M.) comes from San Diego, California. It has five post-nuclear whorls and measures: Length 3.5 mm., diameter 1.7 mm. Cat. no. 162766, U.S.N.M., one specimen from Whites Point, San Pedro. Cat. no. 168569, U.S.N.M., one specimen from U. S. Bureau of Fisheries station 2932, in 20 fathoms, temperature 58°, off Los Coronados Islands.

Named for Mrs. T. S. Oldroyd.

ODOSTOMIA (CHRYSALLIDA) NODOSA Carpenter.

Plate 15, figs. 9, 9*a*.

Chrysallida nodosa CARPENTER, Cat. Mazatlan Shells, 1856, pp. 417, 418.

Shell very elongate-ovate, white. Nuclear whorls small, deeply obliquely immersed in the first of the succeeding turns. Post-nuclear whorls moderately rounded, considerably contracted at the sutures and moderately shouldered at the summit, marked by strongly nodulous, decidedly retractive axial ribs, of which 14 occur upon the first, 16 upon the second to fourth, and 22 upon the penultimate turn. In addition to the axial ribs the whorls are marked between the sutures by four spiral keels which are a little less strong than the ribs and render them nodulous at their junction. The spaces inclosed between the ribs and spiral cords are oblong oval pits on all the whorls but the last on which they are round. Sutures subchanneled. Periphery of the last whorl marked by a strong broad groove, is curved by the axial ribs which extend to the posterior border of the first basal cord. Base of the last whorl well rounded, marked by six strong rounded, spiral cords which are a little weaker at the umbilical area than at the periphery. Spaces separating the spiral cords of the base about as wide as the cords, covered by numerous slender axial threads. Aperture oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, curved, provided with a strong fold at its insertion; parietal wall covered with a thin callus.

Five specimens of this species were taken off *Spondylus* at Mazatlan, Mexico. Tablet 1969, Liverpool collection, British Museum, contains two specimens; one of these has six post-nuclear whorls and measures: Length 4.1 mm., diameter 1.8 mm.

ODOSTOMIA (CHRYSALLIDA) OVATA Carpenter.

Plate 15, figs. 7, 7*a*.

Chrysallida ovata Carpenter, Cat. Mazatlan Shells, 1856, p. 417.

Shell ovate, white. Nuclear whorls obliquely immersed in the first of the succeeding turns above which only the tilted edge of the last volution projects. Post-nuclear whorls slightly rounded, well contracted at the sutures, and moderately shouldered at the summit, marked by nodulose slightly retractive axial ribs of which 20 occur upon the first to second, 18 upon the third, and 22 upon the penultimate turn. In addition to the ribs the whorls are marked between the sutures by four spiral cords considerably less strong than the ribs, which render them nodulous at their junction. The spaces inclosed by the ribs and spiral cords are deep round pits. Sutures well marked but not channeled. Periphery of the last whorl marked by a narrow spiral groove. Base well rounded, marked by six strong broad rounded almost equal and equally spaced spiral cords, the grooved spaces between which are marked by numerous fine axial threads. Aperture oval, slightly effuse anteriorly; posterior angle acute; outer lip rendered slightly sinuous by the spiral cords; columella slender and curved, provided with a fold, deep within, at its insertion; parietal wall covered by a thin callus.

Three specimens of this species taken from *Spondylus* at Mazatlan, Mexico, are on tablet 1968, Liverpool collection, British Museum. One of these has five whorls and measures: Length 3.9 mm., diameter 2.1 mm.

ODOSTOMIA (CHRYSALLIDA) CINCTA Carpenter.

Plate 15, figs. 2, 2*a*.

Chrysallida cincta Carpenter, Rep't Brit. Assn. Adv. Sci., 1864, p. 659.

Shell elongate-ovate, vitreous. Nuclear whorls smooth, deeply immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well rounded, marked by vertical axial ribs which are strongest near the summit, becoming much enfeebled as they pass to the suture. Of these ribs 18 occur upon the second and third and 20 upon the fourth whorl. In addition to the ribs the whorls are marked by four broad, strong, spiral keels which form nodules at their junction with the ribs. On the last whorl the axial sculpture is obsolete on the anterior half between the sutures. Sutures subchanneled. Periphery of the last whorl marked by a strong keel. Base well rounded posteriorly, effuse anteriorly, marked by six low, spiral cords, the two nearest the umbilical area being very faint. Aperture oval, decidedly effuse anteriorly; posterior angle acute; outer lip rendered sinuous by the spiral cords, thin, showing the external sculpture within; columella slender, very long, almost straight, reflected, reënforced by the base, provided with a weak fold at its insertion.

The type (Cat. no. 15730, U.S.N.M.) was collected by Cooper at Santa Barbara, California. It has five post-nuclear whorls and measures: Length 3 mm., diameter 1.5 mm. Cat. no. 162768, U.S.N.M., contains another specimen from San Pedro. Cat. no. 162769, U.S.N.M., one specimen from Pacific Beach, California.

ODOSTOMIA (CHRYSALLIDA) LOOMISI, new species.

Plate 16, fig. 3.

Shell very small, pupiform, vitreous. Nuclear whorls smooth, deeply obliquely immersed in the first of the succeeding turns, above which only a portion of the tilted edge of the last volution projects. Early post-nuclear whorls well rounded, later ones flattened, somewhat excurved at the shouldered and beaded summit, and slightly contracted at the sutures, marked by strong rounded, tuberculated axial ribs, which are decidedly protractive on all but the last whorl; on this they are only moderately protracted. Of the axial ribs, 14 appear upon the first, 16 upon the second, 20 upon the third, and 24 upon the penultimate turn. In addition to the ribs the whorls are marked between the sutures by four spiral cords, which almost equal the ribs in strength, forming tubercles at their junctions with the axial ribs. On the last whorl and one-half the summit drops below the peripheral keel and leaves this in the suture; the axial ribs, however, terminate at the posterior edge of it, and thus leave it without tubercles. The spaces inclosed by the ribs and cords appear as deep oval pits having their long axis parallel to the cords. Sutures well marked but not channeled. Base of the last whorl long, well rounded, marked by seven spiral cords, the four anterior to the periphery being equal and equally spaced, the other three growing successively smaller; channels between the cords very regular, marked by many slender axial riblets. Aperture oval, somewhat effuse anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, curved, and reflected, not reënforced by the base.

The type and five specimens were with Prof. C. B. Adams's type of *Chemnitzia communis* at Amherst College. They come from the Bay of Panama. The type has five post-nuclear whorls and measures: Length 2 mm., diameter 0.9 mm.

Named for Prof. F. B. Loomis.

ODOSTOMIA (CHRYSALLIDA) VICOLA, new species.

Plate 16, fig. 11.

Shell ovate, vitreous. Nuclear whorls large, deeply immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects, which is marked by five slender spiral threads. Post-nuclear whorls rounded on all but the first whorl, marked by very broad, strong, retractive axial ribs, of which 16 occur upon the second and third and 20 upon the penultimate turn. In addition to the axial ribs the whorls are marked by four very broad, low spiral cords, which are separated by mere incised lines between the sutures, which render their junction with the axial ribs very strongly nodulous. Sutures constricted, showing a portion of the peripheral cord. Periphery of the last whorl marked by a strong, well rounded spiral cord. Base of the last whorl decidedly attenuated, marked by seven subequal spiral cords, the spaces between which are marked by numerous slender, axial threads. Aperture elongate-ovate, decidedly effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within, rendered sinuous by the spiral cords; columella long, moderately strong, somewhat sinuous, reflected, reënforced by the base, and provided with a fold at its insertion.

The type (Cat. no. 206899, U.S.N.M.) comes from San Pedro Bay, California. It has five post-nuclear whorls and measures: Length 2.5 mm., diameter 1.2 mm.

ODOSTOMIA (CHRYSALLIDA) ASTRICTA Dall and Bartsch.

Plate 16, fig. 2.

Odostomia (*Chrysallida*) *astricta*, Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 515, pl. 46, fig. 1.

Shell elongate-conic, bluish-white. Nuclear whorls decollated. Post-nuclear whorls very slightly rounded, separated by deeply channeled sutures. In this species the axial ribs exceed the four spiral keels in strength, their junction forming elongated tubercles the long axis of which coincides with the spiral keels. The axial ribs, of which there are 16 upon all of the turns, slant decidedly backward near the aperture. They are rather distantly spaced and the spaces inclosed between them and the spiral keels are deep oblong pits, the long axis of which coincides with the spiral sculpture. Periphery of the last whorl marked by a deep, wide channel across which the ribs extend feebly to the first subperipheral keel. Base rather long and well rounded, marked by seven rather narrow, slender spiral keels which successively decrease in strength from the periphery to the umbilical area, the anterior ones being only faintly indicated; the spaces which separate the keels are about twice as wide as the keels and are crossed by many very slender raised axial threads. Aperture oval, outer lip rather thick, columella twisted, reënforced by the attenuated base and provided with a moderately strong fold at its insertion; parietal wall covered by a strong callus.

The type (Cat. no. 196280, U.S.N.M.) was collected by Mr. F. L. Button at Monterey, California; it has the six last whorls remaining, having lost the nucleus and probably the first post-nuclear turn, and measures: Length 2.9 mm., diameter 1.2 mm.

ODOSTOMIA (CHRYSALLIDA) COOPERI Dall and Bartsch.

Plate 16, fig. 4.

Odostomia (Chrysallida) cooperi Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 514, 515, pl. 46, fig. 7.

Shell broadly conic, white. Nuclear whorls smooth, largely obliquely immersed in the first of the succeeding turns above which only about half of the last turn projects. Post-nuclear whorl moderately rounded, slopingly shouldered at the summit, the shoulder bearing the first of the four stronger tuberculate spiral ridges. The connections which join the tubercles in the spiral series are a little more strongly developed than those which link them vertically, the spaces inclosed between them being deep squarish pits. The tubercles are very prominent and rounded; there are about 16 upon the second, 20 upon the third, and 26 upon the penultimate turn. The axial series slants retractively from the posterior suture. Sutures deep and broad, considerably wider than the spaces between the keels. Periphery of the last whorl deeply channeled, the channel marked by a weak extension of the axial bars which terminate at the first supra-peripheral keel. Base prolonged, well-rounded, marked by seven strong moderately raised spiral keels which, like the channels that separate them, diminish regularly in width from the periphery to the umbilical area; the last, the eighth, immediately behind the columella, being less distinct and considerably broader than the rest. The channels between the keels are about equal to the keels in width and are crossed by numerous very slender raised threads, which extend up on the sides of the keels but do not cross them. About five of these threads fall in the space between two tubercles on the spire, in the first supra-peripheral groove. Aperture oval, large, effuse anteriorly, posterior angle obtuse, outer lip rather thick, not showing the external sculpture within; columella somewhat twisted, revolute anteriorly, reënforced by the attenuated base, and provided with a weak fold at its insertion; parietal wall covered by a callus which joins the columella with the posterior angle of the aperture and renders the peristome almost complete.

The type (Cat. no. 162771, U.S.N.M.) was collected by Doctor Dall at Monterey, California. It has five post-nuclear whorls and measures: Length 3.1 mm., diameter, 1.4 mm.

ODOSTOMIA (CHRYSALLIDA) HIPOLITENSIS, new species.

Plate 16, fig. 8.

Shell very elongate-ovate, bluish-white. Nuclear whorls deeply obliquely impressed in the first of the succeeding turns. Post-nuclear whorls well rounded, marked by four strong spiral cords between the sutures, which are separated by narrow, deeply incised channels. In addition to these spiral cords the whorls are marked by weak axial ribs which extend only feebly to the first supra-peripheral cord, rendering the junction with the cords feebly nodulous. Sutures strongly constricted, not channeled. Periphery of the last whorl marked by a spiral cord. Base well rounded, slightly channeled anteriorly, marked by nine spiral cords which become successively weaker and closer spaced from the periphery to the umbilical area. The spaces between the cords are marked by numerous slender axial threads. Aperture oval, effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; columella moderately strong, twisted, strongly reflected, reënforced by the base, provided with a strong fold at its insertion.

The type (Cat. no. 162770, U.S.N.M.) comes from San Hipolito Point, Lower California. It has five post-nuclear whorls and measures: Length 3.5 mm., diameter 1.7 mm.

ODOSTOMIA (CHRYSALLIDA) LAPAZANA, new species.

Plate 16, figs. 9, *9a*.

Shell broadly ovate, white. Nuclear whorls smooth, deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately contracted at the sutures, strongly slopingly shouldered at the summit, where the angle of the shoulder falls on the second spiral keel. The whorls are marked by well developed, nodulous axial ribs, of which 20 occur upon all the whorls. Intercostal spaces about twice as wide as the ribs, crossed by five equal spiral cords, which are about half as strong as the ribs and render them nodulous at their junction. The first spiral cord is a little posterior to the middle of the shoulder. The spaces inclosed by the ribs and cords are deep, rectangular pits, the long axis of which coincides with the spiral cords. Sutures strongly marked, but not channeled. Periphery of the last whorl marked by a spiral cord to the posterior extremity of which the axial ribs extend, but whose summits they do not cross. Base short, well rounded, marked by nine spiral keels which are about as wide as the spaces that separate them, decreasing successively in strength and spacing from the periphery to the umbilical area. The grooves between the spiral cords are marked by numerous fine, axial raised threads. Aperture oval, slightly effuse anteriorly; posterior angle obtuse; outer lip thin; columella slender, strongly reflected, provided with a fold at its insertion.

The type (Cat. no. 162778, U.S.N.M.) and two specimens were dredged at U. S. Bureau of Fisheries station 2823, in 26.5 fathoms, off La Paz, Lower California. The type has five post-nuclear whorls and measures: Length 2.8 mm., diameter 2.1 mm.

ODOSTOMIA (CHRYSALLIDA) PROXIMA de Folin.

Plate 16, fig. 7.

Noemia proxima DE FOLIN, Fonds de la Mer, vol. 2, 1872, pp. 166, 167, pl. 6, fig. 3.

Shell ovate, conic, crystalline. Nuclear whorls one and one-half, obliquely immersed in the first of the succeeding turns. Post-nuclear whorls strongly constricted at the sutures, moderately shouldered at the summit, marked by strong vertical axial ribs, of which 20 occur upon the second and third and 22 upon the penultimate turn. These ribs disappear at the periphery. The spaces between the ribs are marked by spiral cords a little less strong than the ribs; four of these occur between the sutures on the second and third, and seven upon the penultimate turn. Their intersections with the ribs form nodules. Sutures channeled. Base somewhat attenuated, marked by eleven spiral cords, the spaces between which are axially lirate. Aperture subpyriform, posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, somewhat curved and reflected, provided with a strong fold at its insertion; parietal wall covered with a thin callus.

De Folin's type was collected at Margarita Island, Bay of Panama. It has four post-nuclear whorls and measures: Length 2.5 mm., diameter 1 mm.

ODOSTOMIA (CHRYSALLIDA) TYLERI, new species.

Plate 16, fig. 5.

Shell robust, subdiaphanous to milk-white. Nuclear whorls smooth, immersed in the first of the succeeding turns, above which only a part of the decidedly tilted edge of the last whorl projects. Post-nuclear whorls flattened, slightly excurved at the summit, scarcely at all contracted at the periphery and moderately shouldered at the summit, marked by very strong, rounded, axial ribs, of which 14 occur upon the first, 16 upon the second, 18 upon the third, 20 upon the fourth, 22 upon the fifth, and 24 upon the penultimate turn. In addition to the axial ribs the whorls are marked by spiral cords, less strong than the ribs, the junctions of which with the ribs render them tuberculate. Of these cords, four occur upon all the whorls but the penultimate and last, which have five between the sutures. The spaces inclosed between the ribs and cords are deep square pits. The posterior cord is on the summit of the whorl and is a little stronger than the rest, rendering the whorls, which are excurved, crenulated. Suture well marked but not channeled. Periphery and the somewhat attenuated base of the last whorl well rounded, marked by seven strong, rounded, spiral cords which diminish successively in size and spacing from the periphery to the umbilical area. The channels which separate the cords are marked by numerous fine axial riblets. Aperture irregularly pyriform, somewhat effuse anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella stout, twisted, curved, slightly reflected, reënforced by the base and provided with a strong fold at its insertion; parietal wall covered by a strong callus, which practically renders the peritreme complete.

The type and five specimens were Prof. C. B. Adams's type lot of *Chemnitzia communis* collected in the Bay of Panama. They are at Amherst College. The type has seven post-nuclear whorls and measures: Length 2.8 mm., diameter 1.2 mm.

Named for Prof. J. M. Tyler.

ODOSTOMIA (CHRYSALLIDA) SCAMMONENSIS, new species.

Plate 16, fig. 6, 6*a*.

Shell large, elongate-conic, white. Nuclear whorls smooth, deeply obliquely immersed in the first of the succeeding turns, above which only a portion of the last volution projects. Post-nuclear whorls very slightly rounded, moderately contracted at the sutures, slightly excurved at the shouldered summit, marked by strong, vertical axial ribs, of which 16 occur upon the second and third, 18 upon the fourth, 20 upon the fifth and sixth, and 26 upon the penultimate turn. Intercostal spaces about twice as wide as the ribs, crossed by five slender spiral cords between the sutures, which render the ribs feebly nodulous at their junction. Sutures strongly impressed. Periphery and base of the last whorl decidedly inflated, the latter narrowly umbilicated, marked by seven weak spiral cords. Aperture large, elongate-oval; outer lip thin, showing the external sculpture within; columella slender, curved, reflected, provided with a strong fold at its insertion.

The type (Cat. no. 106518*a*, U.S.N.M.) comes from Scammon Lagoon, Lower California. It has lost the nucleus and the first post-nuclear whorl. The seven remaining measure: Length 5.1 mm., diameter of antepenultimate whorl 1.3 mm., diameter of last whorl 1.7 mm. Cat. no. 162770, U.S.N.M., four specimens from San Hipolito Point. Cat. no. 162780, U.S.N.M., eight specimens from Point Abreojos, Lower California, one of which has served for our description of the nucleus.

ODOSTOMIA (CHRYSALLIDA) PULCHRA de Folin.

Plate 16, fig. 1.

=*Noemia pulchra* DE FOLIN, Fonds de la Mer, vol. 2, 1872, p. 165, pl. 6, fig. 2.

Shell ovate, conic, white, subvitreous, shining. Nuclear whorls one and one-half, obliquely immersed in the first of the succeeding turns. Post-nuclear whorls well rounded, marked by four spiral cords between the sutures and equally strong axial ribs, of which

14 occur upon the second, 16 upon the third, and 18 upon the penultimate turn. Sutures well impressed. Periphery of the last whorl marked by a slender channel. Base well rounded, marked by four subequal, broad, rounded keels, the spaces between which are marked by slender riblets. Aperture subpyriform; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, strongly curved, decidedly reflected, provided with a weak fold at its insertion.

De Folin's type came from Margarita Island, Bay of Panama. It has four and one-half post-nuclear whorls and measures: Length 2.2 mm., diameter 1 mm.

ODOSTOMIA (CHRYSALLIDA) MONTEREYENSIS Dall and Bartsch.

Plate 17, fig. 6.

Odostomia (*Chrysallida*) *montereyensis* DALL and BARTSCH, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 516, pl. 46, fig. 4.

Shell broadly conic, milk-white to subdiaphanous. Nuclear whorls smooth, largely immersed in the first of the succeeding turns, above which only half of the last whorl projects. Post-nuclear whorls separated by broad, deep sutures; well rounded between the sutures where they are ornamented by four strongly tuberculate spiral ridges; the spiral connections between the tubercles are equal to the axial connections or ribs, of which 16 appear upon the second, 18 upon the thirtieth, and 20 upon the penultimate whorl. The spaces inclosed between the axial ribs and the spiral connections which join the rounded tubercles are deep, squarish pits. The axial ribs extend strongly across the deep peripheral channel and stop at the first subperipheral keel. Base moderately long, well rounded, marked by five equal and subequally spaced, well raised, strong, spiral keels, and a sixth, much broader, low, and rounded at the columellar margin. The grooves between the keels are equal to the width of the keels near the periphery, but diminish in breadth successively from the periphery to the umbilical area. They are crossed by numerous slender, raised, axial threads, which extend up on the sides of the spiral keels, but do not cross them. There are about five of these threads between each two ribs in the first subperipheral channel; aperture oval, somewhat effuse anteriorly; posterior angle acute; columella reënforced by the attenuated base, against which it appears like a thickened callus, provided with a moderately strong oblique fold at its insertion; parietal wall covered by a thick callus, which joins the columella with the posterior angle of the aperture.

The type (Cat. no. 196281, U.S.N.M.) has 5 post-nuclear whorls and measures: Length 3 mm., diameter 1.3 mm. It was collected by Mr. S. S. Berry, in 12 fathoms, off Del Monte, Monterey Bay, California. Three specimens from the same station are in Mr. Berry's collection. Another specimen (Cat. no. 74003, U.S.N.M.) was collected by Doctor Canfield at Monterey, and a sixth (Cat. no. 196282, U.S.N.M.) by Mr. F. L. Button at the same place. A seventh (Cat. no. 162767, U.S.N.M.) was collected by Mrs. T. S. Oldroyd at San Luis Obispo, California.

ODOSTOMIA (CHRYSALLIDA) PULCIA, new species.

Plate 16, figs. 10, 10*a*.

Shell small, ovate, vitreous. Nuclear whorls deeply, very obliquely immersed in the first of the post-nuclear whorls, above which only the tilted edge of the last volution projects, which is marked by five slender spiral threads. Post-nuclear whorls well rounded, strongly contracted at the sutures and shouldered at the summits, marked by very strong, decidedly retractively curved, axial ribs, of which 16 occur upon the first, 18 upon the second, and 20 upon the penultimate turn. In addition to the axial ribs, the whorls are marked between the sutures by four very broad, low, spiral bands, which are separated by mere impressed lines, and which render the axial ribs feebly tuberculated. Suture subchanneled. Periphery of the last whorl marked by a narrow deep groove, which is not crossed by the axial ribs. Base well rounded, crossed by six spiral cords which grow decidedly weaker and closer spaced from the periphery to the umbilical area, the spaces between them being crossed by numerous slender, axial threads. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella stout, strongly reflected anteriorly, provided with a weak fold at its insertion.

The type and 35 specimens (Cat. no. 162763, U.S.N.M.) come from San Pedro, California. The type has four post-nuclear whorls and measures: Length 2.2 mm., diameter 1.2 mm. Seventy specimens from the same locality were identified for Mrs. Oldroyd. Cat. no. 168568, U.S.N.M., thirty-seven specimens also from San Pedro.

ODOSTOMIA (CHRYSALLIDA) VIRGINALIS, new name.

=*Evalea gracilienta* (Carpenter) Keep, West Coast Shells, 1888; p. 52; not *Odostomia gracilienta* Monterosoto, 1884.

Plate 18, figs. 7, 7*a*.

Shell elongate-conic, thin, semitranslucent. Nuclear whorls obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects, which is marked by three strongly elevated spiral threads. Post-nuclear whorls well-rounded, moderately contracted at the sutures, and strongly slopingly shouldered, marked by weak rounded axial ribs which are best developed near the edges of the shoulder. Of these ribs about 24 are indicated on the first turn, 18 upon the second to fourth, and 20 upon the penultimate turn. In addition to the axial sculpture the whorls are marked between the sutures by a number of spiral keels of diverse strength, of which 4 occur upon the first and second, 5 upon the third, 6 upon the fourth and the penultimate whorl. Of these spiral ridges the second one below the summit is the strongest and marks the angle of the shoulder. The junction of the ribs and cords form feeble nodules best shown at the shoulder. Sutures strongly constricted. Periphery of the last whorl marked by a low cord. Base well rounded, marked by four low, broad cords and seven exceedingly fine incised lines, the latter about the umbilical area. The narrow, strongly incised grooves which separate the cords are crossed by numerous fine axial threads, which give them a pitted appearance. Aperture oval, slightly effuse anteriorly; posterior angle acute; outer lip rendered slightly wavy by the external cords, thin, showing the external sculpture within; columella slender, curved, provided with a deep-seated fold at its insertion.

The type and ten specimens (Cat. no. 46152, U.S.N.M) come from Todos Santos Bay, Lower California. The type has six post-nuclear whorls and measures: Length 3 mm., diameter 1.1 mm.

This is the most variable and the most abundant member of the subgenus *Chrysallida*. On some the axial ribs extend only over the first two cords below the summit, on others they extend strongly over the periphery and part of the base. The spiral cords also vary in number and strength. The general form, however, seems quite constant.

The following specimens have been examined:

U.S.N.M. cat. no.	No. of specimens.	Locality.	Disposition of material.
158570	48	Whites Point, San Pedro, California	U. S. Nat. Mus.
	10	.....do	Oldroyd coll.
	47	San Pedro, California	Do.
	1	Arch Beach, San Diego, California	Univ. Cal. coll.
127546	4	San Hipolito Point, Lower California	U. S. Nat. Mus.
105474	4	Point Abreojos, Lower California	Do.
106499	4	.....do	Do.
60914	1	Todos Santos Bay, Lower California	Do.
46177	1	.....do	Do.
46152	11	.....do	Do.

ODOSTOMIA (CHRYSALLIDA) DEFOLINIA, new name.

Plate 17, fig. 5.

Noemia angusta de Folin, Fonds de la Mer, vol. 2, 1872, p. 165, pl. 6, fig. 7; not *Chrysallida angusta* Carpenter, 1864.

Shell conic, crystalline, shining. Nuclear whorls one and one-half, the greater part immersed in the first of the succeeding turns. Post-nuclear whorls flattened, marked by four spiral ridges between the sutures and axial ribs, the intersections of which form low squarish tubercles of which about 14 occur upon the second and 18 upon the penultimate whorl. Suture poorly impressed. Periphery of the last whorl marked by a spiral cord. Base attenuated, marked by six equally spaced spiral cords and slender axial threads in the grooves between the cords. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella moderately strong, slightly curved, provided with a strong fold a little below its insertion.

De Folin's type comes from Margarita Island, Bay of Panama. It has five post-nuclear whorls and measures: Length 3.6 mm., diameter 1.5 mm. De Folin's figure, which we copy, not having seen any specimens of this species, is inconsistent, in showing five spiral cords on the second and third whorls.

ODOSTOMIA (CHRYSALLIDA) DEFOLINIA CONTRACTA de Folin.

Noemia angusta var. *contracta* de Folin, Fonds de la Mer, vol. 2, 1872, p. 165.

Of this form de Folin says:[a] "Shell similar to *Noemia angusta* but smaller, less ventricose, and more oval; length 3 mm., diameter 1.2 mm."

ODOSTOMIA (CHRYSALLIDA) DEFOLINIA DIFFICILIS, new name.

=*Noemia angusta* var. *ovata* de Folin, Fonds de la Mer, vol. 2, 1872, p. 165; not *Chrysallida ovata* Carpenter, 1856.

Of this form de Folin says:[a] "Shell similar to *Noemia angusta* but smaller, with a spire more ovate, and the whorls more convex; aperture broader; outer lip crenulate; columella less expanded; length 2.7 mm., diameter 1.3 mm."

ODOSTOMIA (CHRYSALLIDA) OREGONENSIS Dall and Bartsch.

Plate 17, figs. 3, 3*a*.

Odostomia (*Chrysallida*) *oregonensis* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 516, 517, pl. 46, figs. 10, 10*a*.

Shell elongate-conic, slender, subdiaphanous to milk-white. Nuclear whorls immersed, the last one only being visible. This is somewhat tilted and marked by three strong narrow spiral keels and many slender raised axial threads which cross the grooves between the keels. Post-nuclear whorls well rounded, slopingly shouldered at the summit and separated by constricted sutures, ornamented by almost equal and equally spaced spiral keels and axial ribs between the sutures on the spire. There are 4 spiral keels on the first, second, and third whorls, 6 on the fourth, and 7 upon the penultimate whorl. The first of these keels is on the shoulder of the whorl near the summit and is somewhat less developed than the rest. The axial ribs are best developed on the early whorls, where they extend equally strong from the summit to the periphery; on the antepenultimate and penultimate turns they become somewhat enfeebled from the middle of the whorl between the sutures to the periphery. There are about 16 of these ribs on the first, 18 on the third, 20 upon the fourth, and 22 upon the penultimate turn. The intersections of the ribs and spiral keels form low elongated tubercles, the long axis of which coincides with the spiral sculpture. The meshes inclosed by the keels and ribs are deeply impressed squarish pits. Periphery and base of the last whorl well rounded, the latter somewhat inflated and marked by six spiral cords, which are successively closer spaced and a little less strongly developed from the periphery to the umbilical area. The channels between the cords are crossed by many very slender raised vertical threads. Aperture oval, slightly effuse anteriorly; outer lip thin; columella reënforced on its posterior two-thirds by the attenuated base, free and somewhat revolute anteriorly; parietal wall glazed by a thin callus.

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[a] Fonds de la Mer, vol. 2, 1872, p. 165.

The type has six post-nuclear whorls and measures: Length 3.3 mm., diameter 1.2 mm. It and nine additional specimens are Cat. no. 107690, U.S.N.M., and were collected by Dr. C. F. Newcombe at Cumshewa Inlet, Queen Charlotte Island, British Columbia, in 10 fathoms. Two other lots of one specimen each come from Monterey, Cat. no. 73998, U.S.N.M., in the Stearns collection, and Cat. no. 196283, U.S.N.M., collected by Mr. F. L. Button.

ODOSTOMIA (CHRYSALLIDA) BENTHINA, new name.

Plate 17, figs. 9, *9a*.

Chrysallida oblonga Carpenter, Cat. Mazatlan Shells, 1856, pp. 418–19; not *Odostomia oblonga* Macgillivray, 1848.

Shell elongate-conic, white. Nuclear whorls small, deeply obliquely immersed in the first post-nuclear turn, above which only the tilted edge of the last volution projects. Post-nuclear whorls well rounded, marked by slender, nodulous, retractive axial ribs, which terminate at the posterior extremity of the supra-peripheral cord, leaving this smooth. Of these ribs about 35 occur upon the first whorl, 28 upon the second and third, 22 upon the fourth, and 26 upon the penultimate turn. In addition to the axial ribs, the whorls are marked by five strong, spiral cords, the junction of which with the ribs form tubercles. Periphery of the last whorl marked by a groove. Base well rounded, ornamented with seven equal and equally spaced spiral cords, the grooves between which are marked by fine, raised axial threads. Aperture pyriform, somewhat effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, curved, and reflected, provided with an oblique fold at its insertion; parietal wall covered with a thin callus.

Four specimens were taken from *Spondylus* at Mazatlan, Mexico. Tablet 1971, Liverpool collection, British Museum, contains the largest specimen and a very young shell. The large one has six post-nuclear whorls and measures: Length 4.8 mm., diameter 1.7 mm.

ODOSTOMIA (CHRYSALLIDA) PROMECES, new species.

Plate 18, figs. 2, 2*a*.

Shell elongate-ovate, vitreous. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects, which is marked by five slender spiral threads. Post-nuclear whorls well rounded, strongly contracted at the periphery and slightly shouldered at the summit, marked on all but the first whorl, which is but feebly sculptured, by strong, rounded, decidedly retractive axial ribs, of which 14 occur upon the second, 16 upon the third, and 20 upon the penultimate turn. In addition to the ribs, the whorls are marked between the sutures, by four low, broad, spiral bands, separated by narrow channels which render their junction with the ribs decidedly nodulous. On the last two whorls the peripheral cord is apparent in the strongly constricted suture. Periphery of the last whorl marked by a strong cord. Base well rounded, marked by three subequal spiral cords and a plain area about the umbilicus. The grooves separating these cords are marked by many slender axial threads. Aperture ovate, posterior angle obtuse; outer lip thin, showing the external sculpture within; columella moderately strong, slightly reflected, reënforced by the base, provided with a fold at its insertion.

The type (Cat. no. 162777, U.S.N.M.) comes from Todos Santos Bay, Lower California. It has five post-nuclear whorls and measures: Length 2.5 mm., diameter 1.1 mm.

ODOSTOMIA (CHRYSALLIDA) PULCHERRIMA, new species.

Plate 17, fig. 7.

Shell large, elongate-oval, vitreous. Nuclear whorls small, smooth, deeply obliquely immersed in the first post-nuclear turn, above which only the tilted edge of the last volution projects. Post-nuclear whorls strongly rounded, decidedly contracted at the sutures and strongly shouldered at the summit. The first is marked by four slender spiral cords and numerous exceedingly fine axial threads. The next three have twenty strong, rounded, axial ribs, which terminate at the posterior edge of the fourth keel, leaving this smooth. On the last whorl the ribs are decidedly enfeebled, being replaced by numerous axial threads. The spiral sculpture consists of four strong cords between the sutures, the three which cross the ribs form strong nodules at their junction with them, while the supraperipheral one is smooth. Suture strongly impressed, slightly channeled. Periphery and base of the last whorl well rounded, marked by eight spiral keels, which grow successively weaker from the periphery to the umbilical region, the last three being very fine. Spaces separating the cords equal to them, crossed by numerous slender, axial threads. Aperture irregularly ovate, posterior angle obtuse; outer lip strong, rendered decidedly sinuous by the axial ribs; columella short, decidedly twisted, strongly curved, reflected, reënforced by the base and provided with a deep-seated fold at its insertion; parietal wall glazed with a thin callus.

The type (Cat. no. 206900, U.S.N.M.) comes from Terminal Island, California. It has six post-nuclear whorls and measures: Length 5 mm., diameter 2.3 mm.

ODOSTOMIA (CHRYSALLIDA) VINCTA, new species.

Plate 17, fig. 4.

Shell elongate-ovate, white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns. Post-nuclear whorls flattened, strongly contracted at the periphery, well shouldered at the summit, marked by strong, somewhat retractive axial ribs, which terminate at the posterior edge of the first supraperipheral keel, which is smooth. Of these ribs, 18 occur upon the second, 20 upon the third, 22 upon the fourth, and 27 upon the penultimate turn. In addition to the axial ribs the whorls are marked by four spiral keels, which equal the ribs in strength and render their junction nodulous. The spaces inclosed by the axial ribs and spiral cords are well impressed round pits. Sutures strongly channeled. Periphery of the last whorl marked by a strong groove. Base of the last whorl well rounded, marked by five spiral cords, which grow successively a little weaker from the periphery to the umbilical area. The spaces between these cords are marked by slender spiral threads, which correspond to the ribs on the spire. Aperture oval, posterior angle obtuse; outer lip thin, rendered wavy by the spiral cords; columella moderately strong, decidedly curved, reflected, and reënforced by the base, provided with a slender fold at its insertion.

The type (Cat. no. 162762, U.S.N.M.) comes from San Pedro, California. It has six post-nuclear whorls and measures: Length 2.7 mm., diameter 1.3 mm. Another specimen was identified for Mr. Berry from the same locality.

ODOSTOMIA (CHRYSALLIDA) FASCIATA Carpenter.

Plate 17, fig. 2.

Chrysallida fasciata CARPENTER, Cat. Mazatlan Shells, 1856, p. 423.

Shell elongate-ovate, white. Nuclear whorls small, obliquely immersed in the first of the succeeding turns. Post nuclear whorls moderately rounded, ornamented by decidedly retractive axial ribs which practically terminate at the posterior edge of the supraperipheral spiral keel. Of these ribs, 12 occur upon the first, 14 upon the second, 18 upon the third, and 22 upon the penultimate turn. In addition to these ribs the whorls are marked by four spiral keels between the sutures which equal the ribs in strength and render the three anterior to the summit tuberculated at their junction, the fourth one being smooth. Sutures strongly channeled. Periphery of the last whorl marked by a groove. Base well rounded, marked by six slender spiral keels, which are a little less strongly developed and more closely spaced at the umbilical area than at the periphery. Grooves separating these keels, about twice as wide as the keels, crossed by slender axial threads which correspond to the ribs. Aperture ovate, somewhat effuse anteriorly; posterior angle obtuse; outer lip sinuous, thin, showing the external sculpture within; columella moderately strong, reflected, provided with a slender fold at its insertion; parietal wall glazed with a thin callus.

Twenty specimens were taken off *Spondylus* at Mazatlan, Mexico. Tablet 1981, Liverpool collection, British Museum, contains five specimens, one of which has five post-nuclear whorls and measures: Length 2.1 mm., diameter 1.1 mm.

ODOSTOMIA (CHRYSALLIDA) HELGA, new species.

Plate 17, figs. 8, 8*a*.

Shell conic, milk-white. Nuclear whorls smooth, deeply obliquely immersed in the first of the succeeding whorls, above which only a portion of the last two volutions project. Post-nuclear whorls moderately rounded, slightly contracted at the sutures, feebly shouldered at the summits, marked between the sutures by four broad low spiral bands which are separated by narrow, deeply incised lines. In addition to these bands, the first three and one-half whorls are marked by feeble axial ribs which are best developed near the summit of the whorls and scarcely reach the suture. The junction of the ribs and cords form weak nodules. Sutures strongly impressed but not channeled. Periphery of the last whorl well rounded, marked by a low spiral cord. Base strongly rounded posteriorly, attenuated anteriorly, marked by seven spiral cords, which grow successively weaker from the periphery toward the umbilical region and are separated by slender, deeply-incised spiral lines. Aperture large, broadly oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella moderately strong, curved, reflected, and reinforced by the base; provided with an oblique fold at its insertion.

The type (Cat. no. 60905, U.S.N.M.) and ten specimens come from San Diego, California. The type has six post-nuclear whorls and measures: Length 4.2 mm., diameter 2 mm.

Examination of the following specimens has been made:

U.S.N.M. cat. no.	No. of specimens.	Locality.	Disposition of material.
60905	11	San Diego, California	U. S. Nat. Mus.
162774	100	San Pedro, California	Do.
	190	....do	Oldroyd coll.
206901	9	San Pedro Bay, California	U. S. Nat. Mus.
206902	11	Terminal Island, California	Do.
162773	6	Pacific Beach, California	Do.
	1	Arch Beach, California	Univ. Cal. coll.

ODOSTOMIA (CHRYSALLIDA) SANCTORUM, new species.

Plate 18, fig. 1.

Shell elongate-ovate, light yellow. Nuclear whorls smooth, deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, very slightly contracted at the sutures, moderately shouldered at the summits, marked by a strongly incised spiral line a little distance below the summit, and three feeble ones of which one is at the periphery, the other two dividing the space between those two into three equal areas. These lines, excepting the one near the summit, which is strong throughout, are best developed on the early whorls. In addition to the spiral sculpture, the whorls are marked between the sutures by strong lines of growth and indications of feeble axial ribs which tend to render the early whorls somewhat nodulous. Sutures strongly impressed. Periphery of the last whorl strongly inflated. Base well rounded posteriorly, slightly attenuated anteriorly, marked by six well incised equal and subequally spaced spiral grooves which are crossed by many slender axial threads. Aperture large, oval, effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; columella moderately strong, curved, reflected, reinforced by the base, provided with a deep-seated fold.

The type and three specimens (Cat. no. 46499, U.S.N.M.) comes from Todos Santos Bay, Lower California. The type has four and one-half post-nuclear whorls and measures: Length 2.5 mm., diameter 1.3 mm. Cat. no. 206803, U.S.N.M., three from San Hipolito Point, Lower California.

ODOSTOMIA (CHRYSALLIDA) SAPIA, new species.

Plate 18, figs. 3, 3*a*.

Shell oval, semitranslucent. Nuclear whorls small, deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects, which is marked by five slender spiral threads. Post-nuclear whorls amply rounded, slightly constricted at the sutures and appressed at the summits, marked by six spiral cords between the sutures, of which the second and third below the summit are very narrow, occupying together about as much space as one of the other cords. These cords are separated by grooves which almost equal them. Axial sculpture reduced to feeble indications of ribs which are best shown near the summit of the whorls, where they render the spiral keels feebly nodulous. About twenty-two of these ribs appear upon the penultimate whorl. Periphery and base of the last whorl well rounded, marked by seven spiral keels, which grow successively weaker from the periphery to the umbilical area. Channels separating the cords narrow, well incised, crossed by numerous slender axial threads. Aperture large, broadly ovate, posterior angle acute; outer lip thin; columella moderately strong, curved, slightly reflected; parietal wall glazed with a thin callus.

The type (Cat. no. 162775, U.S.N.M.) comes from San Diego, California. It has four post-nuclear whorls and measures: Length 1.8 mm., diameter 1.1 mm.

ODOSTOMIA (CHRYSALLIDA) ROTUNDATA Carpenter.

Plate 18, fig. 4.

Chrysallida rotundata Carpenter, Cat. Mazatlan shells, 1856, p. 418.

Shell ovate. Nuclear whorls two and one-half, forming a depressed helicoid spire whose axis is at right angles to that of the succeeding turns. Post-nuclear whorls well rounded, moderately contracted at the sutures, very slightly shouldered at the summit, marked by five strong spiral keels on all the whorls between the sutures, excepting the first which has four and obsolete axial ribs on the first two. These axial ribs are best expressed near the summit of the whorls, scarcely reaching the suture, and rendering the spiral cords feebly tuberculate. On the last whorl the axial sculpture is reduced to numerous raised axial threads, like those between the cords on the base. Suture poorly defined. Base of the last whorl well rounded, marked by six spiral cords of which the two anterior ones are a little weaker than the rest; separated by spaces which are a little narrower than the cords and crossed by numerous fine axial threads. Aperture pyriform, posterior angle acute; outer lip thin, showing the external sculpture within; columella stout, curved, provided with a weak fold at its insertion; parietal wall covered with a thin callus.

Nine complete shells and a few fragments were found on *Spondylus* at Mazatlan, Mexico. Tablet 1970, Liverpool collection, British Museum, contains two specimens. One of these has four post-nuclear whorls and measures: Length 2.3 mm., diameter 1.1 mm.

ODOSTOMIA (CHRYSALLIDA) DECEPTRIX, new species.

Plate 17, fig. 1.

Shell ovate, white. Nuclear whorls smooth, deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls somewhat inflated, constricted at the sutures and feebly shouldered at the summits, marked by four equal well incised, spiral lines between the sutures and numerous very retractive lines of growth, with a few feeble indications of axial ribs, at and near the summit, which renders the first and sometimes the second space between the incised lines below the summit feebly nodulous. Suture strongly impressed. Periphery and base of the last whorl somewhat inflated, well rounded, marked by seven incised spiral lines, which decrease regularly in spacing from the periphery to the umbilical area. Aperture broadly oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella quite strong, strongly curved, provided with a strong fold at its insertion; parietal well glazed with a thin callus.

The type and four specimens (Cat. no. 206904, U.S.N.M.) comes from San Hipolito Point, Lower California. The type has five post-nuclear whorls and measures: Length 2.8 mm., diameter 1.3 mm. Cat. no. 206905, U.S.N.M., contains three specimens from Point Abreojos, Lower California.

Subgenus PYRGULINA A. Adams.

Pyrgulina A. Adams, Journ. Linn. Soc. London (Zool.), 1863, p. 4.

Shell with strong axial ribs which extend from the summit to the umbilical area; intercostal spaces of spire and base marked by fine incised spiral lines—not raised threads.

Type.—*Chrysallida casta* A. Adams.

ODOSTOMIA (PYRGULINA) MARGINATA C. B. Adams.

Plate 18, figs. 5, 5*a*.

Chemnitzia marginata C. B. Adams, Ann. Lyc. Nat. Hist. of N. Y., vol. 5, 1852, pp. 391, 392.

Shell small, elongate-conic, rather stout, semitranslucent. Nuclear whorls small, two and one-half, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fourth immersed. Post-nuclear whorls flattened, moderately contracted at the sutures and slightly shouldered at the summit, marked by very strong, lamellar, somewhat retractive axial ribs, of which 14 occur upon all of the whorls. The termination of these ribs form cusps at the summits. Intercostal spaces four times as wide as the ribs, marked by six equal and equally spaced incised lines, the space between the summit and the first line below it appearing as a thickened cord. Sutures well impressed. Periphery of the last whorl and base well rounded, marked by the strong continuation of the axial ribs and about five incised spiral lines. Aperture ovate; posterior angle acute; outer lip thin, showing the external sculpture within; columella stout, slightly curved and some what revolute; parietal wall covered by a very strong callus.

Professor Adams's type, which comes from Panama, has served for our description and figure. It is at Amherst College. It has six and one-half post-nuclear whorls and measures: Length 2.8 mm., diameter 1.1 mm.

Subgenus **EGILA** Dall and Bartsch.

Egila Dall and Bartsch, Proc. Biol. Soc. Wash., vol. 17, 1904, p. 11.

Odostomias with the axial ribs extending from the summit of the whorls to the umbilical region; periphery with a deep sulcus bounded on each side by a tumid area; the base is spirally striated.

Type.—Parthenia lacunata Carpenter.

KEY TO THE SPECIES OF THE SUBGENUS EGILA.

Axial ribs about 18 upon the last whorl	*lacunata.*
Axial ribs about 30 on the last whorl	*poppei.*

ODOSTOMIA (EGILA) LACUNATA Carpenter.

Plate 19, fig. 1.

Parthenia lacunata Carpenter, Cat. Mazatlan Shells, 1856, p. 414.

Shell small, oval, white. Nucleus almost completely obliquely immersed in the first of the succeeding turns. Post-nuclear whorls flattened, with subtabulated summits and deeply sulcated periphery, marked by sublamellar, slightly retractive axial ribs, of which 14 occur upon the first and second and 18 upon the penultimate turn. Intercostal spaces three times as wide as the ribs, smooth. Periphery deeply and broadly sulcate, bordered on each side by a low spiral cord, crossed by the continuations of the axial ribs. Base of the last whorl well rounded, marked by the axial ribs which continue almost undiminished to the umbilical chink and about twelve spiral lirations. Aperture oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, curved, and slightly revolute; parietal wall covered by a thin callus.

Doctor Carpenter's type, which is on tablet 1964 Liverpool collection, British Museum, and six specimens were taken from *Spondylus* at Mazatlan, Mexico. The type has four post-nuclear turns and measures: Length 1 mm., diameter 0.57 mm.

ODOSTOMIA (EGILA) POPPEI, new species.

Plate 19, fig. 3.

Shell elongate-ovate, milk-white. Nuclear whorls small, completely obliquely immersed in the first post-nuclear turn above which the tilted edge of the last volution only projects. Post-nuclear whorls slightly rounded, strongly tabulatedly shouldered at the summit, and decidedly sulcate at the periphery, marked by strong, well-rounded, curved, somewhat retractive axial ribs, of which 22 occur upon the second, 26 upon the third, and 30 upon the penultimate turn; on the first they are obsolete. Intercostal spaces well impressed, about as wide as the ribs. The posterior edge of the peripheral sulcus coincides with the summits of the whorls, which render the sutures profoundly channeled. The sulcus is bordered on each side by a well-rounded, slender, spiral cord, which forms low tubercles at the junction with the ribs. The peripheral sulcus is crossed by the undiminished axial ribs, which break it up into a series of deep pits. Base of the last whorl somewhat attenuated, with a shallow pit at the umbilical region, marked by the continuations of the axial ribs, which here have a decidedly retractive slant, and about twelve slender, spiral lirations. Aperture oval; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella stout, curved, reënforced by the base, provided with a well-developed fold at the insertion of the columella; parietal wall covered by a thin callus.

The type (Cat. no. 106519, U.S.N.M.) and another specimen come from Point Abreojos, Lower California. The type has five post-nuclear whorls and measures: Length 2.2 mm., diameter 1.1 mm.

Three additional specimens from the same locality have been examined in Mr. Delos Arnold's collection.

Named for Professor Ewald Poppe.

Subgenus **HALDRA** Dall and Bartsch.

Haldra Dall and Bartsch, Proc. Biol. Soc. Wash., vol. 17, 1904, p. 11.

Odostomias with more or less irregular, acute axial ribs extending from the summits of the whorls to the umbilical region, crossed by subequally spaced acute spiral ridges between the sutures and on the base. The intersections of the ribs and spiral ridges are thickened, but scarcely nodulous, lending the shell a very rough appearance.

Type.—*Chrysallida photis* Carpenter.

ODOSTOMIA (HALDRA) PHOTIS Carpenter.

Plate 18, fig. 8.

Chrysallida photis Carpenter, Cat. Mazatlan Shells, 1856, p. 425; +*Chrysallida clathratula* Carpenter, Cat. Mazatlan Shells, 1856, p. 424; not *Chemnitzia clathratula* C. B. Adams.

Shell small, pupiform, white. Nuclear whorls at least two, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-half immersed. Post-nuclear whorls well rounded, moderately concontracted at the suture, slightly shouldered at the summit, marked by strongly raised, narrow, somewhat retractive axial ribs, of which 12 occur upon the first, 14 upon the second, and about 20 upon the penultimate turn. In addition to the axial ribs the whorls are marked between the sutures by five strong, narrow, spiral keels which render the intersections of the ribs cuspidate. Sutures well impressed. Periphery and base of the last whorl well rounded, marked by the strong continuations of the axial ribs and five spiral keels, similar to those between the sutures. Aperture pear-shaped; outer lip thin, showing the external sculpture within; columella strongly curved and revolute, provided with a weak fold at its insertion; parietal wall covered with a thin callus.

The type and another specimen were taken off *Spondylus*, at Mazatlan, Mexico. The type has five post-nuclear whorls and measures: Length 1.2 mm., diameter 0.48 mm. The type is on tablet 1985, Liverpool collection, British Museum. Another specimen taken from *Chama* at Mazatlan, is on tablet 1983, Liverpool collection. It is listed as *Chrysallida clathratula* C. B. Adams.

IVIDELLA, new subgenus.

=*Funicularia* MONTEROSATO, Conch. Med., 1884, p. 85. Type.—*Rissoa excavata* PHILIPPI; not *Funicularia* LAMARCK. + *Ividia* (species), DALL and BARTSCH, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 517–18.

Odostomias marked with lamellar spiral ridges and equally strong lamellar axial ribs, both of which ornament spire and base.

Type.—Odostomia (*Ividia*) *navisa* Dall and Bartsch.

When we diagnosed *Ividia*[a] we unfortunately selected *Parthenia armata* Carpenter as type. Since then we have examined Doctor Carpenter's type of *Parthenia armata* in the British Museum and find that the species must be referred to *Miralda*, which necessitates the selection of a new type for the group defined. Since this can not be done without change of name, we propose *Ividella*.

Type.—Odostomia (*Ividia*) *navisa* Dall and Bartsch.

KEY TO THE SPECIES OF THE SUBGENUS IVIDELLA.

Base with a single spiral lamella .... *pedroana*, p. 172.
Base with two spiral lamellæ.
  Diameter of shell more than 1.2 mm.
    Shell robust, short .... *navisa*, p. 173.
    Shell thin, slender .... *n. delmontensis*, p. 174.
  Diameter of shell less than 1 mm .... *orariana*, p. 175.
Base with three spiral lamellæ .... *quinquecincta*, p. 174.

ODOSTOMIA (IVIDELLA) PEDROANA, new species.

Plate 19, figs. 8, 8*a*.

Shell large, robust, chocolate-brown. Nuclear whorls two, moderately large, forming a helicoid spire whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Post-nuclear whorls very strongly sculptured, with three spiral keels between the sutures, one of which at the summit is slender, the other two are strong and equal, the supraperipheral one being about as far posterior to the suture as the one at the summit is from its neighbor. In addition to the spiral keels the whorls are marked by narrow retractive axial ribs, of which 14 occur upon the first, 16 upon the second to third, 18 upon the fourth, 20 upon the fifth and sixth, and 24 upon the penultimate turn. The junctions of the axial ribs and spiral keels are somewhat tuberculated, while the spaces inclosed between them are deeply impressed pits. A strong keel marks the periphery of the last whorl and another equally strong occupies the middle of the base, the space between them being a concave channel, which, like the one posterior to the peripheral keel, is crossed by the axial ribs. The axial ribs become much enfeebled as they pass over the basal keel and are almost obsolete on the spaces anterior to it. Aperture irregularly oval; posterior angle obtuse; outer lip thin, rendered angular by the spiral keels; columella very strong, almost straight, slightly reflected; parietal wall covered by a thin callus.

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[a] Proc. Biol. Soc. Wash., vol. 17, 1904, p. 11.

The type (Cat. no. 107422, U.S.N.M.) comes from San Pedro, California. It has eight post-nuclear whorls, and measures: Length 6.7 mm., diameter 2.5 mm.

We have examined the following specimens:

U.S.N.M. cat. no.	No. of specimens.	U. S. B. F. station.	Locality.	Depth, fathoms.	Collector.	Disposition of material.
162845	1		San Pedro, California		H.N.Lowe	U. S. N. Mus.
152171*a*	4		do		Johnston	Do.
	9		do		Oldroyd	Oldroyd coll.
	2		San Pedro (Whites Point).		do	Do.
46162	2		Catalina Island, California.	12		U. S. N. Mus.
162846	5	3566	San Diego, California	3		Do.
162847	7	3572	do	2		Do.
109364	4		do			Do.
	2		do		Oldroyd	Oldroyd coll.
160094	1		San Diego (off Coronado Hotel), California.		Kelsey	U. S. N. Mus.
74022	4		do			Do.
32305	1		do			Do.
106425	1		Scammon Lagoon, Lower California.			Do.

ODOSTOMIA (IVIDELLA) NAVISA Dall and Bartsch.

Plate 18, figs. 11, 11*a*.

Odostomia (*Iridia*) *navisa* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 517, 518, pl. 46, figs. 2, 2*a*.

Shell of medium size, strongly sculptured, subdiaphanous to milk-white. Nuclear whorls at least two, obliquely a little more than half immersed. Post-nuclear whorls strongly shouldered, subtabulated, with a strong, broad, spiral keel limiting the anterior edge of the shoulder and an acute raised keel on the middle of the whorls between the sutures, while a third equally acute keel marks the periphery of the last whorl. Two other keels ornament the base, the anterior one of which is not quite as strong as its neighbor. The axial sculpture consists of narrow, more or less lamellar, almost vertical ribs, which render the intersection with the spiral keels somewhat thickened, but not nodulose. These axial ribs extend over the periphery and base of the last whorl to the umbilical region, gradually growing weaker as they approach this point. There are about 18 on the second and 20 upon the penultimate whorl. The spaces between the ribs and keels appear as concave quadrangular depressions. Umbilicus narrowly perforated. Suture deeply channeled by the shouldered whorl. Aperture suboval, posterior angle decidedly obtuse; outer lip thick, marked by 5 projections, corresponding to the 5 keels; columella almost straight, strongly revolute with a conspicuous oblique fold near its insertion; parietal wall covered by a faint callus showing both basal keels, the anterior faint and just posterior to the insertion of the columella and the next on the middle of the wall.

The type has 5 post-nuclear whorls and measures: Length 2.7 mm., diameter 1.3 mm. It and three additional specimens (Cat. no. 106502, U.S.N.M.) were collected by Mr. Henry Hemphill at Scammon Lagoon, Lower California. Three additional lots are in the U. S. National Museum collection: Cat. no. 129336, 30 specimens collected by Mrs. T. S. Oldroyd in the drift at San Pedro; Cat. no. 162843, 3 specimens also from San Pedro by the same donor; Cat. no. 62844, 1 specimen collected by Mr. Henry Hemphill at Ocean Beach, San Diego, California.

ODOSTOMIA (IVIDELLA) NAVISA DELMONTENSIS Dall and Bartsch.

Plate 18, figs. 10, 10*a*.

Odostomia (*Ividia*) *navisa delmontensis* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 518, pl. 46, figs. 3, 3*a*.

Shell similar to *O.* (*I.*) *navisa* but more elongate, and in every way more delicate, with the lamellose sculpture reduced almost to raised cords and with stronger shouldered summits and more open umbilicus.

The type (Cat. no. 196297, U.S.N.M.) was collected by Mr. S. S. Berry in 12 fathoms, off Del Monte, Monterey Bay, California. It has five post-nuclear whorls and measures: Length 3.2 mm., diameter 1.3 mm.

ODOSTOMIA (IVIDELLA) QUINQUECINCTA Carpenter.

Plate 18, fig. 9.

Parthenia quinquecincta Carpenter, Cat. Mazatlan Shells, 1856, p. 414.

Shell elongate-ovate. Nuclear whorls tumid, obliquely immersed. Post-nuclear whorls flattened, strongly tabulatedly shouldered at the summit, and strongly contracted at the periphery, marked by strong lamellar ribs, of which 12 occur upon the first, 14 upon the second, and 16 upon the penultimate turn. In addition to the axial ribs the whorls are marked by six strong spiral cords, one of which is at the angle of the shoulder and another at the periphery, the third falls a little anterior to the suture, while the other three divide the remainder of the base into four almost equal parts. Aperture oval, posterior angle obtuse; outer lip thin, rendered angulated by the spiral cords; columella slender, curved, and somewhat revolute, provided with an oblique fold at its insertion; parietal wall covered with a strong callus.

Two specimens were taken off *Spondylus*, at Mazatlan, Mexico. The finest of these is on tablet 1963, Liverpool collection, British Museum. It has four post-nuclear whorls and measures: Length 1.8 mm., diameter 0.6 mm.

ODOSTOMIA (IVIDELLA) ORARIANA, new name.

Plate 18, fig. 12.

Cingula (?) *turrita* C. B. ADAMS, Ann. Lyc. Nat. Hist. of N. Y., 1852, pp. 406, 407; not *Odostomia turrita* HANLEY, 1844.

Shell elongate, conic, turreted; milk-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls strongly tabulately shouldered at the summit, flat in the middle, sloping suddenly toward the suture; ornamented by slender axial ribs, of which 15 occur upon the second and 18 upon the remaining whorls. In addition to the axial ribs, the whorls are marked between the sutures by two strong spiral keels, one of which is situated at the angle of the shoulder, the other at the posterior termination of the anterior third between the sutures. The junctions of the axial ribs and spiral keels are very slightly nodulous. Sutures deeply channeled. Periphery of the last whorl well rounded, marked by a spiral keel. Base well rounded, marked by two spiral keels, which divide the space between the peripheral keel and the umbilical area into three equal parts, and the continuation of the axial ribs, which are fainter on the base than on the spire. Aperture ovate; posterior angle obtuse; outer lip thin, rendered angular by the keels; columella slender, decidedly curved, reënforced by the base; parietal wall covered with a thin callus.

The type, which is at Amherst College, was collected by Prof. C. B. Adams at Panama. It has six post-nuclear whorls and measures: Length 2 mm., diameter 0.8 mm.

Subgenus MIRALDA A. Adams.

Miralda A. Adams, Jour. Linn. Soc. London, vol. 7, 1864, p. 3. + *Lia* de Folin, Fonds de la Mer, 1870, p. 515. Type, *Lia decorata* de Folin. +*Ividia* Dall and Bartsch, Proc. Biol. Soc. Wash., vol. 17, 1904, p. 11. Type, *Parthenia armata* Carpenter.

Odostomias with very strong spiral keels between the sutures and on the base; the anterior one of which, and sometimes the one next to it, strongly crenulate; the remainder simple and acute. Base axially lirate.

Type.—*Parthenia diadema* A. Adams.

KEY TO THE SPECIES OF THE SUBGENUS MIRALDA.

Spiral keels between the sutures 3 .... *hemphilli*, p. 176.
Spiral keels between the sutures 2.
Base with 3 spiral cords.
Posterior keel between the sutures much wider than its neighbor . *armata*, p. 177.
Posterior keel between the sutures not wider than its neighbor.
Spiral keels between the sutures almost smooth .... *exarata*, p. 177.
Spiral keels between the sutures nodulose .... *terebellum*, p. 177.
Base with two basal cords.
Shell stout .... *æpynota*, p. 178.
Shell slender .... *galapagensis*, p. 179.

ODOSTOMIA (MIRALDA) HEMPHILLI, new species.

Plate 19, fig. 10.

Shell broadly conic; milk-white. Nuclear whorls deeply obliquely immersed, apparently smooth. Post-nuclear whorls well rounded, marked with three strong, equal spiral keels, the posterior two of which are tuberculate, the third one smooth. The tubercles are connected axially by slender riblets, which extend to the third keel. There are about twenty tubercles on the latter whorls, while on the early whorls they are ill defined. Sutures deeply channeled. Periphery of the last whorl marked by a smooth spiral keel, equal to the one posterior to it. Base moderately long, well rounded, marked by four spiral keels which grow successively weaker anteriorly. Aperture irregularly ovate; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella stout, provided with a strong fold at its insertion.

The type (Cat. no. 162841, U.S.N.M.) was collected at San Hipolito Point, Lower California. It has six post-nuclear whorls and measures: Length 3.5 mm., diameter 1.4 mm. Another specimen from the same locality is in Mr. Henry Hemphill's collection. Cat. no. 162842, U.S.N.M., one specimen from San Pedro, California. One specimen from Point Abreojos, Lower California, Cat. no. 106498 U.S.N.M.

Named for Henry Hemphill.

ODOSTOMIA (MIRALDA) ARMATA Carpenter.

Plate 19, fig. 6.

Parthenia armata Carpenter, Cat. Mazatlan Shells, 1856, p. 415.

Shell elongate-conic, white. Nuclear whorls two, deeply, obliquely immersed in the first of the succeeding turns. Post-nuclear whorls marked by two strongly elevated tuberculate keels between the sutures, the posterior one of which is about twice as wide as its neighbor. Of the crenulations about 20 appear upon the second and third, 22 upon the fourth, and 24 upon the penultimate turn. Sutures strongly channeled. The periphery is marked by a slender keel, while the base has two a little weaker than the peripheral one which divides the space between this and the umbilical area into three equal parts. Aperture ovate; outer lip thin; columella rather thick, reflected and provided with a slender fold at its insertion; parietal wall provided with a thin callus.

Twelve specimens were taken off *Chama* and *Spondylus* at Mazatlan, Mexico. The most perfect specimen in the lot is on tablet 1965, Liverpool collection, British Museum. It has six post-nuclear whorls and measures: Length 2.5 mm., diameter 0.85 mm.

ODOSTOMIA (MIRALDA) EXARATA Carpenter.

Plate 19, fig. 2.

Parthenia exarata Carpenter, Cat. Mazatlan Shells, 1856, pp. 415, 416.

Shell elongate-ovate, white. Nuclear whorls obliquely immersed, only the tilted edge of the last volution is visible. Post-nuclear whorls marked by two very strongly elevated spiral keels which divide the space between the sutures into three equal parts. The posterior of these keels shows weak crenulation. Periphery of the last whorl marked by a third keel which is almost as strong as those on the spire. A fourth keel considerably less strong occupies the middle of the base. The rounded spaces between the keels are marked by feeble lines of growth. Aperture irregularly oval; posterior angle obtuse; outer lip angulated by the keels; columella strong, reflected, provided with a weak fold at insertion; parietal wall covered with a thin callus.

Doctor Carpenter's type and another specimen were taken from *Chama* at Mazatlan, Mexico. The type is on tablet 1966, Liverpool collection, British Museum. It has five post-nuclear whorls and measures: Length 6.3 mm., diameter 0.8 mm.

ODOSTOMIA (MIRALDA) TEREBELLUM C. B. Adams.

Plate 19, fig. 4.

Cingula (?) *terebellum* C. B. Adams, Ann. Lyc. Nat. Hist. of N. Y., 1852, p. 406.

Shell elongate, ovate, milk-white. Nuclear whorls completely immersed in the first of the succeeding turns, above which the tilted edge of the last volution only projects, which shows faint traces of spiral lirations. Post-nuclear whorls ornamented with two strong spiral lamellæ, the first of which renders the summit of the whorls decidedly tabulated, while the second one is situated a little posterior to the posterior termination of the anterior third between the sutures. Both lamellæ are faintly nodulous; the posterior one slightly more so than the anterior. The deep channel between the two keels is marked by very feeble slender axial threads. Periphery of the last whorl marked by a lamella a little less strong than those between the sutures. Base with two lamellæ, the anterior of which is immediately behind the columella and much less developed than the median one, which is somewhat weaker than the peripheral lamella. The depressed spaces between these lamellæ are crossed by axial threads, as on the spire. Aperture irregularly ovate; posterior angle decidedly obtuse; outer lip rendered angular by the spiral lamellæ; columella strong, somewhat twisted, reënforced by the base.

The type, which is at Amherst College, was collected by Professor C. B. Adams in Panama Bay. It has five post-nuclear whorls and measures: Length 2.2 mm., diameter 1 mm.

ODOSTOMIA (MIRALDA) ÆPYNOTA, new species.

Plate 19, fig. 5.

Shell pupiform, translucent. Nuclear whorls small, obliquely immersed in the first post-nuclear turns, marked by four spiral cords. Post-nuclear whorls with the summits appressed, marked by two strong, spiral keels between the sutures, a third at the periphery, and a fourth on the middle of the base, the last two somewhat less strong than the rest. The posterior keel forms the strong tabulation at the summit of the whorls and is strongly tuberculated, 14 tubercles appearing upon the second and 20 upon the remaining whorls. The space between the keels is marked by rather strong lines of growth. The greatest convexity coincides with the superperipheral keel. Aperture irregularly ovate, somewhat effuse anteriorly; posterior angle obtuse; outer lip angulated by the keels, thin, showing the external markings within; columella strong, curved, without visible fold in the aperture; reënforced by the base; parietal wall covered by a thin callus.

The type and 30 specimens (Cat. no. 129335, U.S.N.M.) comes from San Pedro. The type has five post-nuclear whorls and measures: Length 1.9 mm., diameter 0.9 mm.

Examination of the following specimens has been made:

U.S.N.M. cat. no.	No. of specimens.	Locality.	Disposition of material.
129335	31	San Pedro, California	U. S. Nat. Mus.
105467	3	San Diego, California	Do.
16222	1	Cape St. Lucas, Lower California	Do.
	23	San Pedro, California	Oldroyd coll.
	2	Whites Point, California	Do.
	1	Catalina Island, California	S. S. Berry coll.

ODOSTOMIA (MIRALDA) GALAPAGENSIS, new species.

Plate 19, fig. 7.

Shell conic, milk-white. Nuclear whorls at least two, forming a depressed helicoid spire, which is slightly tilted to one side and for the greater part immersed in the first of the succeeding turns. The tilted edge of the nucleus shows traces of spiral lirations. Post-nuclear whorls appressed at the summit, ornamented by two very strong, lamelliform keels, whose edges are decidedly upturned, forming deeply channeled troughs. The posterior of the two lamellæ is feebly crenulated. Periphery of the last whorl marked by a spiral keel which is about half as strong as those between the sutures. A fourth keel, a little weaker than the peripheral one, marks the middle of the base. The deep concave channels between the keels are marked by strong lines of growth. Sutures strongly channeled. Aperture irregularly oval; posterior angle obtuse; outer lip rendered angular by the spiral keels; columella stout, curved, reënforced by the base; parietal wall covered with a thin callus.

The type (Cat. no. 206906, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2813, in 40 fathoms, on coral sand bottom, near the Galapagos Islands. It has six post-nuclear whorls and measures: Length 2.0 mm., diameter 0.8 mm.

Subgenus IVARA Dall and Bartsch.

Ivara Dall and Bartsch, Mem. Cal. Acad., vol. 3, 1903, p. 285; Proc. Biol. Soc. Wash., vol. 17, 1904, p. 11.

Odostomias having feebly developed axial ribs which are usually only indicated near the summits of the whorls; spiral sculpture consisting of many subequally spaced fine lirations; summits of the whorls strongly tabulated.

Type.—Odostomia (*Ivara*) *turricula* Dall and Bartsch.

ODOSTOMIA (IVARA) TURRICULA Dall and Bartsch.

Plate 19, fig. 9.

Odostomia (*Ivara*) *terricula* (misprint for *turricula*) Dall and Bartsch, Mem. Cal. Acad. Sci., vol. 3, 1903, p. 285, pl. 4, fig. 14.

Shell very elongate-ovate, milk-white. Nuclear whorls smooth, obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, very broadly tabulately shouldered at the summit, moderately contracted at the periphery, marked by low, feebly developed axial ribs, which are best shown at the angle of the shoulder and scarcely extend to the suture. In addition to the axial ribs, the whorls are marked by well-incised spiral lines, of which 7 occur between the sutures on the second and 9 upon the third and the penultimate turn. Periphery and base of the last whorl well rounded, the latter somewhat produced, marked by the very feeble continuation of the axial ribs and eight spiral lines. Aperture ovate, posterior angle squarely truncated; outer lip thin; columella strongly curved and reflected over the reënforcing base; provided with a strong fold at its insertion.

The type and 34 specimens (Cat. no. 168716, U.S.N.M.) were collected at San Pedro, California. The type has five post-nuclear whorls and measures: Length 4 mm., diameter 1.8 mm.

The following additional specimens have been examined:

U.S.N.M. cat. no.	No. of specimens.	Locality.	Disposition of material.
168716	35	San Pedro, California	U. S. Nat. Mus.
207128	10	do	Do.
	21	do	Oldroyd coll.
	2	do	Do.
168717	3	Catalina Island, California	U. S. Nat. Mus.
	2	Arch Beach, California	Univ. Cal. coll.
46176	1	Todos Santos Bay, Lower California	U. S. Nat. Mus.
105499	1	Point Abreojos, Lower California	Do.

One specimen (Cat. no. 73999, U.S.N.M.) not quite perfect, comes from Monterey, California, and is provisionally referred to the species.

Subgenus **EVALINA** Dall and Bartsch.

Evalina Dall and Bartsch, Proc. Biol. Soc. Wash., vol. 17, 1904, p. 12.

Odostomias having feebly developed axial ribs which are usually only indicated near the summit of the whorls; spiral sculpture consisting of many fine lirations; summit of the whorls not tabulated.

Type.—*Odostomia* (*Evalina*) *americana* Dall and Bartsch.

KEY TO THE SPECIES OF THE SUBGENUS EVALINA.

Spiral lirations on the body whorl 23 .... *americana*, p. 180.
Spiral lirations on the body whorl 15 .... *intermedia*, p. 181.

ODOSTOMIA (EVALINA) AMERICANA Dall and Bartsch.

Plate 20, figs. 7, 7*a*.

Odostomia (*Evalina*) *americana* Dall and Bartsch, Proc. Biol. Soc. Wash., vol. 17, 1904, p. 16.

Shell elongate-conic, subdiaphanous to milk-white. Nuclear whorls quite large, at least two about three-fourths obliquely immersed. Post-nuclear whorls rather broad between the sutures, well rounded, faintly shouldered at the summit, ornamented with depressed, rounded, rather broad axial ribs, about 18 of which occur upon the second, 20 on the third, and 18 upon the penultimate whorl. The ribs are best developed near the summits of the whorls and scarcely extend to the periphery. Spiral lirations low, rounded, subequal, about 12 occur between the sutures upon the third and the penultimate whorls. These spiral lirations like the axial ribs appear strongest near the summits of the whorls. Periphery and base of the last whorl well rounded, the latter ornamented by about eleven lirations, which are similar in character to those between the sutures but much less strongly expressed. Aperture rather broad, suboval, somewhat effuse anteriorly, posterior angle acute; outer lip thin; columella short, somewhat curved, strongly revolute anteriorly, having a weak oblique fold at its insertion.

The type (Cat. no. 168718, U.S.N.M.) and nine specimens come from San Pedro, California. It has five post-nuclear whorls and measures: Length 2.9 mm., diameter 1.3 mm.

The following specimens have been examined:

U.S.N.M. cat. no.	No. of specimens.	Locality.	Disposition of material.
168718	12	San Pedro, California	U. S. Nat. Mus.
168719	1	San Diego, California	Do.
168720	2	Santa Catalina Island, California	Do.
162677	2	La Jolla, California	Do.
	2	Arch Beach, California	Univ. Cal. coll.
	10	San Pedro, California	Oldroyd coll.

ODOSTOMIA (EVALINA) INTERMEDIA Carpenter.

Plate 20, fig. 6.

Dunkeria intermedia CARPENTER, Cat. Mazatlan Shells, 1856, pp. 435, 436.

Shell elongate-ovate, white. Nuclear whorls large, two and one-half, forming a depressed helicoid spire, whose axis is at right angles to that of the succeeding turns, in the first of which it is about one-fifth immersed. Post-nuclear whorls well rounded, marked by very much enfeebled indications of axial ribs, which are best shown at the summit of the whorls, and broad low spiral lirations, of which 7 occur between the sutures. Periphery and base of the last whorl well rounded, marked by eight low spiral cords, which are somewhat closer spaced about the umbilicus. Aperture oval; outer lip thin, showing the external sculpture within; columella slender and curved.

The type and another specimen were taken off *Spondylus*, at Mazatlan, Mexico. It has three post-nuclear whorls and measures: Length 1.4 mm., diameter 0.7 mm. It is on tablet 2010, Liverpool collection, British Museum.

Subgenus IOLÆA A. Adams.

Iolæa A. ADAMS, Proc. Zool. Soc., 1867, p. 310. =*Iole* A. ADAMS, Ann. Mag. Nat. Hist., 3d ser., vol. 5, 1860, p. 300; not *Iole* BLYTH, Journ. Asiat. Soc. Bengal, vol. 13, pt. 1, 1844, p. 386.

Shell umbilicated, marked by spiral cords, and axial riblets which cross the grooves between them.

Type.—Iole scitula A. Adams.

KEY TO THE SPECIES OF THE SUBGENUS IOLÆA.

Shell strongly shouldered.
  Shell stout, adult 2.3 mm. in diameter .... *amianta*, p. 182.
  Shell slender, adult 1 mm. in diameter .... *eucosmia*, p. 183.
Shell not shouldered .... *delicatula*, p. 183.

ODOSTOMIA (IOLÆA) AMIANTA Dall and Bartsch.

Plate 20, figs. 8, 8*a*.

Odostomia (*Iolæa*) *amianta* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 519, pl. 46, figs. 9, 9*a*.

Shell broadly conic, yellowish-white. Nucleus small, of two whorls which increase extremely rapidly in size and are obliquely placed. Post-nuclear whorls very strongly shouldered, marked by three very strong lamellar spiral keels on the first and second and four on the succeeding whorls between the sutures. The posterior keel marks the limit of the broad, sloping shoulder and is much the strongest. It is also placed a little farther apart from the next spiral keel than that is from its anterior neighbor. Base of the last whorl well rounded; ornamented by eight spiral ridges, which are less elevated and much more closely and regularly spaced than those between the sutures. The peripheral groove is about equal in width to the one anterior to the posterior keel. The entire shell is marked by fine, sublamellar, regularly spaced, retractive axial ribs, which render the spiral keels somewhat crenulated at their meeting points and break the spaces between them into small squares or oblongs. These riblets extend from the sutures to the small umbilicus. Aperture subovate, posterior angle obtuse; outer lip thin, somewhat wavy, showing the external sculpture within; columella moderately stout, somewhat curved and strongly revolute, having an oblique fold near its insertion which is barely visible when the aperture is viewed squarely; parietal wall covered by a fairly thick callus.

The type and another specimen (Cat. no. 105483, U.S.N.M.) were collected at Point Abreojos, Lower California, by Mr. Henry Hemphill. It has six post-nuclear whorls and measures: Length 4.4 mm., diameter 2.3 mm.

The following specimens have been examined:

No. of specimens.	Locality.	Collector.	Catalogue No.
1	Monterey Bay	Rev. G. W. Taylor	No. 37253 U.S.N.M.
6	Monterey, off Del Monte (12 fathoms).	S. S. Berry	S. S. Berry's coll.
1	do	W. H. Dall	No. 168683 U.S.N.M.
1	San Pedro	Mrs. T. S. Oldroyd	No. 168684 U.S.N.M.
1	San Pedro, Long Beach	H. N. Love	No. 196298 U.S.N.M.
1	San Pedro, station 83	University of California	Univ. Cal. coll.
1	Off Catalina Island, station 28	do	Do.
5	Off Catalina Island, station 30	do	Do.
11	San Diego, station 47	do	Do.
2	do	F. W. Kelsey	No. 160115 U.S.N.M.
1	do	Henry Hemphill	No. 105469 U.S.N.M.
1	Off Coronado Island, 20 fathoms; bottom temperature 58°.	U. S. B. F. station (2932)	No. 168685 U.S.N.M.
2	Point Abreojos, Lower California.	Henry Hemphill	No. 105483 U.S.N.M. (1=type).
1	Pacific Beach, California		Oldroyd coll.
2	San Pedro, California		Do.

ODOSTOMIA (IOLÆA) EUCOSMIA, new name.

=*Oscilla insculpta* (Carpenter) Keep, West Coast Shells, 1888, p. 52; not *Odostomia insculpta* De Kay, 1843.

Plate 20, figs. 10, 10*a*.

Shell elongate-conic, subdiaphanous to milk-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last one projects. Post-nuclear whorls somewhat contracted at the periphery, very strongly slopingly shouldered at the summit, marked by three strong lamellar keels between the sutures, of which the middle one is a little nearer to its anterior neighbor than to the posterior, the latter being about as far from the summit as it is from the median keel. The deep channels between the keels and the shoulders are crossed by slender axial riblets which have a protractive slant on the shoulder and are decidedly retractive in the channels. Periphery of the last whorl marked by a keel a little weaker than those between the sutures. Base short, well rounded, narrowly umbilicated, marked by three spiral cords and a slender raised thread about the umbilicus, the channels bounding the peripheral cord and those of the base are crossed by riblets as on the spire. Aperture large; posterior angle obtuse; outer lip rendered angulated by the keels, thus showing the external sculpture within; columella slender, very strongly curved, slightly reflected, provided with a weak fold at its insertion; parietal wall covered with a weak callus.

The type (Cat. no. 106501, U.S.N.M.) comes from Point Abreojos, Lower California. It has six post-nuclear whorls and measures: Length 2.5 mm., diameter 1 mm.

The following specimens have been examined.

U.S.N.M. cat. no.	No. of specimens.	Locality.	Disposition of material.
106501	[a] 1	Point Abreojos, Lower California	U. S. Nat. Mus.
105483	1	.....do	Do.
46175	1	Todos Santos Bay, Lower California	Do.
129294	32	San Pedro, California	Do.
153091	1	.....do	Do.
105469	2	San Diego, California	Do.
	2	Arch Beach, California	Univ. Cal. coll.
	27	San Pedro, California	Oldroyd coll.

[a] Type.

ODOSTOMIA (IOLÆA) DELICATULA Carpenter.

Plate 20, figs. 5, 5*a*.

Odostomia (*Evalea*) *delicatula* Carpenter, Ann. Mag. Nat. Hist., vol. 14, 1864, p. 47.

Shell very elongate, ovate, crystalline, transparent. Nuclear whorls wholly immersed in the first of the succeeding turns, above which only a portion of the last two project. Post-nuclear whorls well rounded, moderately contracted at the suture, strongly shouldered at the summit, marked by five strong, well-rounded, equal and equally spaced spiral keels between the sutures, the first of which is at the summit. The spaces separating the keels are strongly incised, a little wider than the keels and crossed by numerous, slender retractive axial riblets. Periphery of the last whorl marked by a keel. Base somewhat protracted, well rounded, minutely umbilicated, marked by seven spiral cords which grow successively weaker from the periphery to the umbilicus; spaces between the cords marked like those on the spire. Aperture large; posterior angle acute; outer lip thin, showing the external sculpture within; columella long, slender, somewhat curved, very strongly reflected, provided with a strong fold at its insertion; parietal wall covered by a thin callus.

The type (Cat. no. 4102 U. S. N. M.) comes from Cape St. Lucas, Lower California. It has four post-nuclear whorls and measures: Length 2.3 mm., diameter 0.7 mm.

Subgenus **MENESTHO** Möller.

Menestho Möller, Ind. Moll. Greenl., 1842, p. 10. +*Odetta* de Folin, Fonds de la Mer, 1870, p. 314. Type, *Odetta elegans* de Folin. +*Jaminea* de Folin, Constit. Method. de la Fam. Chemnitiziidæ, 1885, p. 15. Type, *Jaminea bilirata* de Folin; not *Jaminea* Brown, 1827. +*Jaminina* de Folin, Zool. Record, vol. 22, 1885, p. 94. Type, *Jaminea bilirata* de Folin.

Shell not umbilicated, marked by moderately well developed and usually equally spaced spiral cords; axial sculpture reduced to mere lines of growth which frequently appear as *very slender* raised threads in the grooves between the cords.

Type.—*Turbo albulus* Fabricius.

KEY TO THE SPECIES OF THE SUBGENUS MENESTHO.

- Entire surface of the shell marked by spiral cords.
  - Shell elongate-conic.
    - Shell large, adult more than 5 mm. long.............. *grammatospira*, p. 185.
    - Shell small, adult less than 2.5 mm. long.................. *pharcida*, p. 185.
  - Shell elongate-ovate or ovate.
    - Last whorl marked by about 40 spiral cords.................. *exara*, p. 186.
    - Last whorl marked by less than 20 spiral cords.
      - Spiral cords 2 between the sutures of the last whorl .... *ziziphina*, p. 186.
      - Spiral cords 3 between the sutures of the last whorl......... *recta*, p. 187.
      - Spiral cords 4 between the sutures of the last whorl.
        - Basal cords 3.................................... *amilda*, p. 187.
        - Basal cords 4.
          - Shell ovate.............................. *callipyrga*, p. 188.
          - Shell elongate-ovate.
            - Spiral sculpture very strong.................. *farma*, p. 188.
            - Spiral sculpture very feeble.................. *enora*, p. 189.
        - Basal cords 7................................... *chilensis*, p. 189.
        - Basal cords 11..................................... *fetella*, p. 189.
      - Spiral cords 6 between the sutures of the last whorl.
        - Basal cords 5................................ *hypocurta*, p. 190.
        - Basal cords 6 .... *æquisculpta*, p. 191.
        - Basal cords 8................................ *harfordensis*, p. 191.
- Base of the shell only marked by spiral cords.................... *sublirulata*, p. 192.

ODOSTOMIA (MENESTHO) GRAMMATOSPIRA Dall and Bartsch.

Plate 21, figs. 7, 7*a*.

Odostomia (*Oscilla*) *grammatospira* Dall and Bartsch, Mem. Cal. Acad. Sci., vol. 3, 1903, p. 285, pl. 1, figs. 6, 6*a*.

Shell elongate-conic, semitranslucent. Nuclear whorls small, forming a depressed helicoid spire, which is a little more than half obliquely immersed in the first of the succeeding turns. Post-nuclear whorls moderately rounded, marked by four strong, equal, and almost equally spaced spiral cords which are separated by three well-incised spiral grooves. Suture subchanneled. Periphery of the last whorl marked by a depressed cord which is not quite as strong as those between the sutures. Base somewhat attenuated, well rounded, marked by ten spiral cords which grow successively weaker and closer spaced from the periphery toward the umbilical area, disappearing altogether on the extreme anterior portion. The spaces between the spiral cords on spire and base are marked by slender axial threads. Aperture oval, effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within, rendered wavy by the keels; columella stout, reflected, reënforced by the base, provided with a weak fold at its insertion; parietal wall glazed with a faint callus.

The type (Cat. no. 161625, U.S.N.M.) was collected at Cape St. Lucas, Lower California. It has eight post-nuclear whorls and measures: Length 5.3 mm., diameter 2.1 mm.

ODOSTOMIA (MENESTHO) PHARCIDA Dall and Bartsch.

Plate 21, fig. 5.

Odostomia (*Menestho*) *pharcida* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 520, pl. 46, fig. 8. *Mumiola tenuis* Dall, Bull. Nat. Soc. Brit. Col., 1897, p. 14, pl. 1, fig. 10; not *Odostomia tenuis* Carpenter, 1856, nor *Odostomia tenuis* Jeffrey, 1884.

Shell small, subcylindric, yellowish-white. Nuclear whorls deeply immersed, a portion of the last and the penultimate only appear when viewed from the side; this gives the shell a truncated appearance. Post-nuclear whorls moderately well rounded, rather wide between the sutures, and somewhat shouldered at the summits; ornamented by strong, low, rounded spiral cords, which are separated by moderately deep, narrow, depressed channels. Six of these cords occur upon the first, 7 upon the second to the penultimate whorl between the sutures; the posterior cord is a little broader and less elevated than the rest, while some of those on the penultimate turn show a tendency to divide—that is, a faint spiral line is apparent on the middle of some of these cords. Sutures well impressed. Periphery and base of the last whorl well rounded, the latter ornamented by eight rounded spiral cords similar to those between the sutures. The spaces between the spiral ridges on the base and between the sutures are marked by closely placed, exceedingly slender, raised axial threads. Aperture pyriform, somewhat effuse anteriorly, posterior angle acute: columella short, curved, reënforced by the attenuated base, free only at its extreme anterior end, with an oblique fold near its insertion; parietal wall covered by a thin callus.

The type (Cat. no. 107440, U.S.N.M.) was dredged by Dr. C. F. Newcombe, in 10 to 15 fathoms, at Cumshewa Inlet, Queen Charlotte Island, British Columbia. It has four post-nuclear whorls, which measure: Length 2.2 mm., diameter 0.9 mm.

ODOSTOMIA (MENESTHO) EXARA Dall and Bartsch.

Plate 21, fig. 1.

Odostomia (Menestho) exara Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 521, 522, pl. 46, fig. 6.

Shell elongate-ovate, subdiaphanous. Nuclear whorls smooth, deeply immersed in the first of the succeeding turns, only a part of the last one appearing above it. Post-nuclear whorls somewhat inflated, well rounded, marked on the first whorl by 8, on the second by 12, on the third by 14, and on the penultimate between the sutures by 20 subequal and equally spaced, low, depressed spiral cords which are separated by narrower channels. Periphery and base of the last whorl inflated, sculptured like the spire by probably 20 spiral cords. In addition to the spiral sculpture the entire surface is marked by fine incremental lines which are best marked in the spaces between the cords. Aperture oval, somewhat effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; columella decidedly curved, reënforced by the attenuated base, free only at its anterior extremity, where it is somewhat revolute, provided with a prominent fold at its insertion which appears as the thickened inflection of the columella; parietal wall covered by a thin callus.

The type (Cat. no. 196250, U.S.N.M.) comes from Pacific Grove, Monterey, California. It has five post-nuclear whorls and measures: Length 3.9 mm., diameter 2.1 mm.

ODOSTOMIA (MENESTHO) ZIZIPHINA Carpenter.

Plate 20, fig. 2.

Parthenia ziziphina Carpenter, Cat. Mazatlan Shells, 1856, p. 416.

Shell conic, white. Nucleus mammillated. Post-nuclear whorls marked by five spiral lirations of which two appear between the sutures, one at the periphery and two on the base. Columella with an oblique fold.

To the above, Doctor Carpenter adds: "Tablet 1967 (Liverpool collection) contains a small Ziziphinus-shaped shell, very young, differing from *P. exarata* in the number and strength of spiral ridges. Length 0.65 mm., diameter 0.55 mm. One specimen was taken from *Chama* at Mazatlan, Mexico."

From an examination of the type we are able to add that it is a much worn, young, and distorted *Menestho*.

ODOSTOMIA (MENESTHO) RECTA de Folin.

Odetta recta DE FOLIN, Les Fonds de la Mer, vol. 2, 1872, pp. 167, 168.

Shell conic, ventricose, subcrystalline, robust, with straight spire. Nuclear whorls three, forming an acute apex, having their axis at right angles to that of the succeeding turn. Post-nuclear whorls four, marked by three broad, strong, somewhat rounded, spiral keels between the sutures, the spaces between which are less wide than the keels. Sutures ill defined. Last whorl almost equal to half the length of the shell. Base marked by less developed spiral cords. Aperture oval; columella provided with a strong fold.

De Folin's type, which was unfortunately crushed by him while being drawn, comes from the Margarita Island, Bay of Panama.. It had four post-nuclear whorls and measured: Length 2.0 mm., diameter 1.1 mm.

ODOSTOMIA (MENESTHO) AMILDA, new species.

Plate 21, fig. 4.

Shell ovate, transparent. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last whorl projects. Post-nuclear whorls well rounded, slightly contracted at the sutures, and somewhat shouldered at the summits, the first marked by four slender equal and subequally spaced incised spiral lines; the rest are marked by a strongly incised groove a little below the summit which causes this to appear bounded by a well-rounded cord; the remainder of the whorls between the sutures show a few distantly spaced and feebly incised spiral lines and numerous very fine, decidedly retractive lines of growth. Periphery of the last whorl well rounded. Base somewhat inflated, well rounded, slightly attenuated anteriorly, marked by numerous exceedingly fine, microscopic spiral striations and three well incised equal and equally spaced lines on the anterior half. Aperture oval, somewhat effuse anteriorly; posterior angle obtuse; outer lip thin, showing the external sculpture within; columella slender, decidedly curved, somewhat reflected, reënforced by the base; provided with a strong fold at its insertion.

The type (Cat. no. 60905, U.S.N.M.) comes from San Diego, California. It has four post-nuclear whorls and measures: Length 2.6 mm., diameter 1.3 mm. Two additional specimens (Cat. no. 206907, U.S.N.M.) come from Round Island, Lower California.

ODOSTOMIA (MENESTHO) CALLIPYRGA Dall and Bartsch.

Plate 20, fig. 9.

Odostomia (*Odetta*) *callipyrga* Dall and Bartsch, Proc. Biol. Soc. Wash., vol. 17, 1904, p. 12. =*Odetta elegans* de Folin, Fonds de la Mer, vol. 2, 1872, p. 167, pl. 6, fig. 4; not *Odostomia* (*Evalea*) *elegans* A. Adams, 1860, nor *Harvella* [=*Odostomia*] *elegans* H. and A. Adams, 1863, nor *Odostomia elegans* Monterosato, 1869.

Shell oblong-ovate, somewhat ventricose, white. Nuclear whorls nearly half immersed in the first of the succeeding turns. Post-nuclear whorls somewhat inflated, moderately contracted at the periphery and moderately shouldered at the summit, marked by strong spiral cords of which 2 appear upon the first, 3 upon the second, and 4½ upon the penultimate turn between the sutures. These cords are separated by well impressed, narrow, spiral grooves which are crossed by slender axial threads. Periphery and base of the last whorl well rounded, marked by four spiral cords, similar to those on the spire, the space between which is ornamented like the grooves in the spire. Aperture oval; posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, somewhat curved and slightly reflected, provided with a fold at its insertion.

The type was collected at Margarita Island, Bay of Panama. It has four post-nuclear whorls and measures: Length 2.2 mm., diameter 1 mm.

ODOSTOMIA (MENESTHO) FARMA, new species.

Plate 20, figs. 1, 1*a*.

Shell elongate, ovate, cream-colored. Nuclear whorls at least two, marked with three slender, spiral lirations, the apex being deeply obliquely immersed in the first of the succeeding turns. The junction of the nucleus and the post-nuclear whorls is marked by a varix. Post-nuclear whorls well rounded, marked by three equal and subequally spaced spiral grooves which are crossed by slender axial riblets, the combination of grooves and ribs giving the whorls a pitted appearance. The four raised spaces bounded by the spiral grooves are finely spirally striated. Suture deeply channeled. Periphery of the last whorl marked by a spiral groove. Base of the last whorl well rounded, marked by four incised lines on the posterior two-thirds, which are equally spaced but grow successively weaker. The peripheral and first subperipheral channel are equal to those on the spire; all are rendered pitted by the slender axial riblets. Anterior third smooth. Aperture broadly oval, somewhat effuse anteriorly; posterior angle acute; outer lip thin; columella slender, curved, somewhat reflected and reënforced by the base; parietal wall covered by a thin callus.

The type (Cat. no. 206908 U.S.N.M.) comes from Catalina Island, California. It has five post-nuclear whorls and measures: Length 2.4 mm., diameter 1.2 mm.

ODOSTOMIA (MENESTHO) ENORA, new species.

Plate 21, fig. 2.

Shell elongate-ovate, milk-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well rounded, slightly contracted at the sutures and weakly shouldered at the summits, marked between the sutures by four feebly incised spiral grooves of which the second one above the periphery is the weakest. Periphery of the last whorl somewhat inflated. Base well rounded posteriorly, somewhat attenuated anteriorly, marked by four subequal but unequally spaced incised spiral lines. Aperture oval, somewhat effuse anteriorly; posterior angle acute; outer lip thin; columella slender, slightly curved and somewhat revolute, provided with a weak fold at its insertion.

The type and two specimens (Cat. no. 207126 U.S.N.M) come from San Pedro, California. The type has six post-nuclear whorls and measures: Length 2.8 mm., diameter 1.3 mm.

ODOSTOMIA (MENESTHO) CHILENSIS, new species.

Plate 21, fig. 6.

Shell milk-white. (Nuclear whorls decollated.) Post-nuclear whorls well rounded, slightly constricted at the suture and moderately shouldered at the summit, marked by four pitted spiral grooves, three of which divide the posterior two-thirds between the sutures into three almost equal areas, while the fourth is at the periphery. The space between the peripheral grooves and the one posterior to it is equal to one-third the space between the sutures. These grooves as well as those on the base are crossed by many slender axial riblets which break them up into pits. The raised spaces between the grooves are marked by slender lines of growth and many extremely fine spiral striations. Suture well impressed. Base of the last whorl well rounded, marked by seven pitted, well incised lines and microscopic spiral striations. Aperture broadly ovate; posterior angle acute; outer lip thin; columella slender, curved, decidedly revolute, provided with a strong oblique fold at its insertion; parietal wall covered with a thin callus.

The type (Cat. no. 109363 U.S.N.M.) was taken from the anchor of the Bureau of Fisheries steamer *Albatross* at Tome, Chile. It is a fragment consisting of the last three whorls (the nucleus and probably the first two post-nuclear whorls being lost), and measures: Length 2.3 mm., diameter 1.2 mm.

ODOSTOMIA (MENESTHO) FETELLA, new species.

Plate 21, figs. 9, 9*a*.

Shell very elongate-ovate, milk-white. Nuclear whorls small, obliquely two-thirds immersed in the first of the succeeding turns.

Post-nuclear whorls well rounded, moderately contracted at the sutures and slightly shouldered at the summit, marked by four strong flattened cords which grow successively a little weaker from the summit to the periphery, separated by narrow, deeply incised spiral grooves. Periphery of the last whorl marked by a broad, flat cord somewhat wider than the first supra-peripheral one. Base of the last whorl somewhat attenuated anteriorly, well rounded, marked by eleven equal and equally narrow, rounded, spiral cords. In addition to this sculpture, there are many very fine incised spiral lines and decidedly retractive axial lines of growth on the spire and base. Aperture broadly oval, slightly effuse anteriorly, posterior angle acute; outer lip thin, showing the external sculpture within; columella moderately strong, slightly curved, somewhat reflected, completely reënforced by the base, provided with a strong fold at its insertion; parietal wall covered by a thin callus.

The type (Cat. no. 46478, U.S.N.M.) and 124 specimens come from San Diego, California. The type has seven post-nuclear whorls and measures: Length 4.4 mm., diameter 1.8 mm.

The following specimens have been examined:

U.S.N.M. cat. no.	Number of specimens.	Locality.	Disposition of material.
126625	12	San Pedro, California	U. S. Nat. Mus.
46498	1	.....do	Do.
208068	150	.....do	Do.
46478	125	San Diego, California	Do.
46477	80	.....do	Do.
	1	Foot of Ash street, San Diego, California.	Oldroyd Coll.
	4	San Diego, California	Univ. of Cal.
127053	10	Long Beach, California	U. S. Nat. Mus.
106520	1	San Ignacio Lagoon, Lower California	Do.

ODOSTOMIA (MENESTHO) HYPOCURTA, new species.

Plate 21, fig. 8.

Shell very elongate-ovate, bluish-white. (Nuclear whorls decollated.) Post-nuclear whorls well rounded, marked by five broad, strong, deeply incised spiral grooves, that divide the space between the sutures into raised, flattened keels, which are successively a little wider from the summit to the periphery. Periphery of the last whorl marked by a groove similar to those above. Base rather short, moderately rounded, marked by five subequal and subequally spaced spiral grooves which are a little weaker than those on the spire. The entire surface of the shell is marked by slender lines of growth, and the raised spaces between the spiral grooves are finely spirally striated. Suture strongly impressed. Aperture ? (outer lip fractured); columella strong, curved, revolute, its posterior two-thirds reënforced by the base; columellar fold not visible in the aperture. Operculum paucispiral.

The unique type (Cat. no. 168660, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 3306, off Bristol Bay, Bering Sea, Alaska, in 33 fathoms, bottom temperature 38.9. It has five post-nuclear whorls and measures: Length 4.3 mm., diameter 2.2 mm.

ODOSTOMIA (MENESTHO) ÆQUISCULPTA Carpenter.

Plate 20, figs. 3, 3*a*.

Odostomia (*Evalea*) *æquisculpta* Carpenter, Ann. Mag. Nat. Hist., 3d ser., vol. 14, 1864, pp. 46, 47=*Odostomia* (*Oscilla*) *æquisculpta* (Carpenter) Dall and Bartsch, Mem. Cal. Acad. Sci., vol. 3, 1903, p. 284, pl. 1, figs. 3, 3*a* (part).

Shell elongate-ovate, semitranslucent. Nuclear whorls deeply obliquely immersed, the tilted edge of the last only being visible. Post-nuclear whorls rounded, somewhat inflated, marked by strong, well-rounded, equal spiral keels, of which 4 occur upon the first, 5 on the second, and 6 between the sutures upon the penultimate turn, half of the peripheral one falling in the suture; here too there is a tendency in the one at the summit to become split. Periphery and base of the last whorl well rounded, marked by six spiral cords, which grow successively weaker from the periphery to the base. Spaces between the cords and spire and base narrow, marked by numerous, decidedly retractive axial threads. Suture well impressed. Aperture broadly oval, somewhat effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; columella strong, decidedly reflected anteriorly, reënforced by the base, provided with a small fold at its insertion; parietal wall covered with a faint callus.

The type (Cat. no. 16221, U.S.N.M.) comes from Cape St. Lucas. It has four post-nuclear whorls and measures: Length 2 mm., diameter 1.2 mm.

ODOSTOMIA (MENESTHO) HARFORDENSIS Dall and Bartsch.

Plate 21, fig. 3.

Odostomia (*Menestho*) *harfordensis* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 521, pl. 46, fig. 5.

Shell elongate-ovate, bluish-white. Nuclear whorls smooth, obliquely immersed in the first of the succeeding turns, only two-thirds of the last volution projects above them. Post-nuclear whorls well rounded and somewhat inflated, marked by numerous incremental lines and five equally strong, but irregularly distributed, punctate, incised, spiral lines between the sutures. The two near the summit are placed closer to each other than any of the others, the space between the summits and the second line being about equal to the space inclosed between the first and second supra-peripheral lines. The third line falls on about the middle of the exposed portion of the whorls and is a little nearer to the second line than the one anterior to it. In addition to these five strongly incised lines there are numerous very fine and closely spaced spiral striæ which cross all parts of the surface of the shell. Periphery and base of the last turn inflated, the latter marked by lines of growth and eight strongly incised, punctate spiral lines, which are a little less strongly impressed and a little more closely spaced at the umbilical area than at the peripheral part of the base. These lines equal those of the spire in strength. Sutures constricted. Aperture very large, somewhat effuse anteriorly; posterior angle acute; outer lip thin, showing the external sculpture within; columella curved, reënforced by the attenuated base and provided with a strong fold and its insertion; parietal wall covered by a thin callus.

The type (Cat. no. 196299, U.S.N.M.) was collected by Mrs. Merrihew, at Port Harford, California. It has five post-nuclear whorls and measures: Length 3.2 mm., diameter 1.8 mm.

ODOSTOMIA (MENESTHO) SUBLIRULATA Carpenter.

Plate 20, fig. 4.

Odostomia sublirulata Carpenter, Cat. Mazatlan Shells, 1856, p. 410.

Shell elongate-ovate, milk-white. (Nuclear whorls ?) Post-nuclear whorls moderately rounded, smooth between the well impressed sutures. Periphery of the last whorl somewhat angulated. Base slightly elongated, well rounded, marked by seven subequal slender, raised spiral cords which are separated by channels about one-half as wide as the cords. Aperture oval; posterior angle acute; outer lip thin, decidedly thickened within; columella straight, rather thick, somewhat reflected over the umbilical chink; provided with an oblique fold at its insertion.

The type was taken from a *Spondylus* at Mazatlan, Mexico; it is on tablet 1952, Liverpool collection, British Museum. It has five post-nuclear turns and measures: Length 2 mm., diameter 1 mm.

Subgenus EVALEA A. Adams.

Evalea A. Adams, Ann. Mag. Nat. Hist., vol. 6, 1860, p. 22; +*Ondina* de Folin, Fonds de la Mer, 1870, p. 214; type, *Ondina sulcata* de Folin; +*Auriculina* Gray, Proc. Zool. Soc., 1847, p. 159; type, *Odostomia obliqua* Alder; +*Ptychostomon* Locard, Prod. de les Moll. de France, 1886, p. 228; type, *Turbo conoideus* Brocchi.

Odostomias having the surface marked by fine incised spiral lines.

Type.—*Evalea elegans* A. Adams.

KEY TO THE SPECIES OF THE SUBGENUS EVALEA.

- Shell umbilicated.
  - Spiral sculpture consisting of incised lines only.
    - Columellar fold on the middle of the columella.........*nunivakensis*, p. 194.
    - Columellar fold decidedly posterior to the middle of the columella.
      - Spiral sculpture strong.
        - Shell thick and robust..........................*killisnooensis*, p. 195.
        - Shell thin and delicate.
          - Shell small, adult 4.1 mm. long..........*tillamookensis*, p. 195.
          - Shell larger, adult 5.5 mm. long..................*esilda*, p. 196.
      - Spiral sculpture very fine.
        - Shell very broadly conic.
          - Sutures very strongly contracted................*aleutica*, p. 196.
          - Sutures not strongly contracted.............*kadiakensis*, p. 197.
        - Shell elongate-conic.
          - Summit of the whorls narrowly tabulated........*herilda*, p. 197.
          - Summit of the whorls not tabulated.
            - Sutures strongly contracted.
              - Whorls well rounded.
                - Shell very small, adult 1.6 mm. long.*tenuis*, p. 197.
                - Shell larger, adult 3 mm. long......*valdezi*, p. 198.
              - Whorls flattened in the middle........... *nemo*, p. 198.
            - Sutures not strongly contracted...............*io*, p. 199.
        - Shell ovate...*pratoma*, p. 199.
  - Spiral sculpture consisting of fine incised lines and slender raised lirations, the latter stronger than the spaces between the striations.
    - Spiral lirations confined to the base..................*septentrionalis*, p. 200.
    - Spiral lirations on spire and base.........................*capitana*, p. 200.
- Shell not umbilicated.
  - Incised spiral lines strong over the entire surface of the shell.
    - Periphery of the last whorl subangulated.
      - Spiral sculpture uniform..................................*jewetti*, p. 201.
      - Spiral sculpture consisting of fine and strong striations...*inflata*, p. 201.
    - Periphery of the last whorl well rounded.
      - Shell elongate-conic..................................*columbiana*, p. 202.
      - Shell elongate-ovate................................*unalaskensis*, p. 203.
  - Incised spiral lines strong on the early whorls and much finer on the later turns.
    - Shell very broadly ovate.
      - Shell with incised lines and raised lirations on the last whorl.*atossa*, p. 203.
      - Shell with incised lines only.
        - Outer lip decidedly expanded anteriorly..............*obesa*, p. 203.
        - Outer lip evenly curved........................... *lucasana*, p. 204.
    - Shell elongate-ovate.
      - Shell white, semitransparent.
        - Adult shell 4.8 mm. long.........................*phanea*, p. 204.
        - Adult shell 3.3 mm. long.......................*phanella*, p. 205.
      - Shell not white nor semitransparent.
        - Incised spirals upon the second whorl 7.....*santarosana*, p. 205.
        - Incised spirals upon the second whorl 15...*tenuisculpta*, p. 206.
  - Incised spiral lines only moderately strong.
    - Periphery of the last whorl very strongly angulated........*angularis*, p. 207.
    - Periphery of the last whorl subangulated.
      - Posterior angle of aperture with weak notch.........*socorroensis*, p. 208.
      - Posterior angle without notch.
        - Adult shell 4.5 mm. long...........................*donilla*, p. 208.
        - Adult shell 3 mm. long..........................*californica*, p. 208.

- Shell not umbilicated—Continued.
  - Incised spiral lines only moderately strong—Continued.
    - Periphery of the last whorl well rounded.
      - Summits of the whorls tabulately shouldered.............*serilla*, p. 209.
      - Summit of the whorls not tabulately shouldered.
        - Shell broadly conic..........................*tacomaensis*, p. 209.
        - Shell elongate-conic.
          - Shell very small, adult 3.3 mm. long.......*amchitkana*, p. 210.
          - Shell larger, more than 5 mm. long...........*stephensi*, p. 210.
        - Shell elongate-ovate..............................*clessini*, p. 211.
  - Incised spiral lines exceedingly fine.
    - Periphery of the last whorl strongly angulated.
      - Shell conic....................................*minutissima*, p. 211.
      - Shell broadly conic.................................*raymondi*, p. 212.
    - Periphery of the last whorl subangulated.
      - Shell large, adult more than 6.5 mm. long...............*gravida*, p. 212.
      - Shell small, adult less than 4 mm. long.
        - Shell elongate-ovate.
          - Summit of the whorls subtabulated.............*notilla*, p. 213.
          - Summit of the whorls slopingly shouldered.....*movilla*, p. 213.
        - Shell ovate...*altina*, p. 214.
    - Periphery of the whorls well rounded.
      - Summit of the whorls tabulated.
        - Shell small, adult 4.5 mm. long...............*profundicola*, p. 214.
        - Shell larger, adult 6.3 mm. long..............*baranoffensis*, p. 215.
      - Summit of the whorls not tabulated.
        - Shell broadly conic.
          - Columella almost straight....................*sitkaënsis*, p. 215.
          - Columella very strongly curved............*hagemeisteri*, p. 216.
        - Shell conic.
          - Shell minute, adult 2.2 mm. long..................*resina*, p. 216.
          - Shell larger, adult 4 mm. long.................*deliciosa*, p. 216.
        - Shell slender, conic.
          - Spiral striations on base and spire uniform.......*parella*, p. 217.
          - Spiral striations stronger on the base than spire.*granadensis*, p. 217.

ODOSTOMIA (EVALEA) NUNIVAKENSIS, new species.

Plate 22, fig. 6.

Shell elongate ovate, deeply umbilicated, milk-white. Nuclear whorls small, deeply obliquely immersed in the first of the succeeding turns. Post-nuclear whorls increasing very regularly in size, rather high between the sutures, well rounded with strongly tabulated summits. Suture strongly marked. Periphery and base of last whorl well rounded, umbilicus bounded by a slender thread. Aperture elongate-ovate, posterior angle obtuse; outer lip thin; columella slender, ε-shaped, slightly revolute, free from the base, armed with a strong fold near its center. Entire surface crossed by fine lines of growth and exceedingly fine, closely spaced, wavy spiral striations.

The unique type (Cat. no. 159476, U.S.N.M.) was collected by Dr. William H. Dall at the north end of Nunivak Island, Alaska. It has five post-nuclear whorls and measures: Length 3 mm., diameter 1.6 mm. The fine spiral striations have been omitted in the drawing.

ODOSTOMIA (EVALEA) KILLISNOOENSIS, new species.

Plate 22, fig. 7.

Shell very elongate ovate, umbilicated, yellowish white. Nuclear whorls very small, obliquely, almost completely immersed in the first of the succeeding turns. Post-nuclear whorls evenly, moderately rounded, with very faintly shouldered summits, marked by numerous, fairly strong, equal and equally closely spaced, wavy, spiral striations, and fine retractive lines of growth. Periphery and base of last whorl well rounded, marked like the spire. Suture well impressed. Aperture ovate, somewhat effuse anteriorly, posterior angle acute; outer lip thin; columella very oblique, posterior two-thirds straight, and strongly reflected, anterior third strongly curved; columellar fold strong, oblique, situated at the insertion of the columella; parietal wall covered by a thin callus.

The type (Cat. no. 159457, U.S.N.M.) was collected by A. Krause, at Killisnoo, Alaska. It has six post-nuclear whorls and measures: Length 6.4 mm., diameter 3 mm. Three other specimens (Cat. no. 205214, U.S.N.M.) from the same place by the same collector were donated to the U. S. National Museum by the Berlin Museum, in whose collection three additional specimens are listed under Cat. no. 36334.

ODOSTOMIA (EVALEA) TILLAMOOKENSIS Dall and Bartsch.

Plate 22, fig. 2.

Odostomia (*Evalea*) *tillamookensis* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 522, 523, pl. 47, fig. 1.

Shell elongate-conic, thin, yellowish white. Nuclear whorls surrounded by the first of the succeeding turns and so immersed as to give the apex a broadly truncated appearance. Post-nuclear whorls inflated, evenly strongly rounded, very slightly shouldered at the summit, separated by well-marked sutures. Periphery and base of the last whorl well rounded, the latter inflated, narrowly openly umbilicated. Entire surface marked by numerous fine, wavy, subequal, weakly incised spiral lines, of which about 35 occur between the summit and the periphery of the last whorl and about an equal number on the base. Aperture oval; outer lip thin; columella slender, evenly gently curved, and slightly revolute, free, not reënforced at the base, provided with a slender fold at its insertion, which is not visible when the aperture is viewed squarely.

The type (Cat. no. 196244, U.S.N.M.) has four post-nuclear whorls and measures: Length 4.1 mm., diameter 2.2 mm. It was dredged by the U. S. Bureau of Fisheries steamer *Albatross* at station 3346, off Tillamook, Oregon, in 786 fathoms, green mud, bottom temperature 37°.3.

ODOSTOMIA (EVALEA) ESILDA, new species.

Plate 22, fig. 1.

Shell elongate-ovate, light yellow. Nuclear whorls decollated. Post-nuclear whorls inflated, slightly rounded in the middle, more so toward the suture, and the appressed summit. Periphery and base of the last whorl well rounded, the latter narrowly umbilicated. Entire surface of spire and base marked by vertical lines of growth and numerous very fine, closely spaced, spiral lirations. Aperture large, oval, slightly effuse anteriorly; posterior angle obtuse; outer lip thin; columella slender, strongly reflected, almost closing the umbilicus; provided with a strong, deep-seated fold at its insertion.

The type (Cat. no. 206909, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2936, in 359 fathoms, temperature 49°, off San Diego, California. It has lost the nucleus and the first post-nuclear turn; the five remaining measure: Length 5.5 mm., diameter 2 mm.

ODOSTOMIA (EVALEA) ALEUTICA, new species.

Plate 22, fig. 5.

Shell broadly conic, light green. Nuclear whorls small, deeply obliquely immersed in the first of the succeeding turns. Post-nuclear whorls somewhat inflatedly rounded, with well-rounded summits. Entire surface marked by fine lines of growth and numerous very fine, closely spaced, wavy, spiral striations. Sutures strongly impressed. Periphery of the last whorl and base well rounded, the latter quite strongly inflated. Aperture broadly ovate, somewhat effuse anteriorly, posterior angle acute; outer lip broadly curved, thin; columella slender, curved, and reflected, free from the base, forming a suggestion of an umbilicus; columellar fold slender, situated a little below the insertion of the columella; parietal wall covered by a thin callus.

The above description is based upon two individuals which, together with twelve other specimens form Cat. no. 205179, U.S.N.M., and which were dredged at U. S. Bureau of Fisheries station 3336, in Iliuliuk Harbor, Bering Sea, Alaska, in 55 fathoms, bottom temperature 41°.6. The nucleus was described from a young individual and the post-nuclear whorls from an adult specimen, which has lost the nucleus and the first post-nuclear turn. The five remaining turns of this measure: Length 4.4 mm., diameter 2.8 mm. Another specimen, Cat. no. 159464, U.S.N.M., was collected in Captains Harbor, Unalaska, Alaska, in 25 fathoms on mud bottom, by Dr. W. H. Dall. Another, Cat. no. 160958, U.S.N.M., also collected by Doctor Dall, comes from Amaknak Island, Unalaska, Alaska.

ODOSTOMIA (EVALEA) KADIAKENSIS, new species.

Plate 22, fig. 9.

Shell very regularly elongate conic, umbilicated, yellowish white. (Nuclear whorls decollated.) Post-nuclear whorls moderately rounded, marked by vertical lines of growth and numerous, exceedingly fine, wavy, spiral striations. Sutures deeply impressed. Periphery of the last well rounded. Base strongly inflated, marked like the spire; umbilicus narrow, partly covered by the strongly reflected columella. Aperture ovate, effuse anteriorly, posterior angle acute; outer lip thin; columella thin, very oblique, strongly curved anteriorly and decidedly reflected, provided with a weak fold a little anterior to its insertion.

The type and another specimen (Cat. no. 159470, U.S.N.M.) were collected by Dr. W. H. Dall at Kadiak Island, Alaska. The type has six post-nuclear whorls and measures: Length 5.2 mm., diameter 2.7 mm.

ODOSTOMIA (EVALEA) HERILDA, new species.

Plate 23, fig. 8.

Shell elongate-conic, light yellow. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns. Post-nuclear whorls cylindric in outline, moderately rounded in the middle and very much so at the very strongly shouldered summit. Sutures well impressed. Periphery short, base of the last whorl well rounded, the latter narrowly umbilicated. Entire surface of spire and base marked by numerous vertical lines of growth and exceedingly fine, closely spaced, wavy spiral striations. Aperture ovate, posterior angle obtuse; outer lip thin; columella slender, somewhat sinuous, slightly reflected, provided with a deep-seated fold a little anterior to its insertion; parietal wall glazed with a thin callus.

The type (Cat. no. 206910, U.S.N.M.) was dredged off San Diego, California. It has six post-nuclear whorls and measures: Length 3.8 mm., diameter 1.8 mm.

ODOSTOMIA (EVALEA) TENUIS Carpenter.

Plate 22, fig. 3.

Odostomia tenuis Carpenter, Cat. Mazatlan Shells, 1856, p. 412; not *Odostomia tenuis* Dall and Bartsch, Mem. Cal. Acad. Sci., vol. 3, 1903, p. 281, pl. 1, fig. 14.

Shell elongate-conic, bluish-white. Nuclear whorls small, deeply obliquely immersed. Post-nuclear whorls inflated, well rounded, somewhat overhanging, strongly constricted at the suture. Periphery and base of the last whorl somewhat inflated, well rounded, strongly umbilicated. Entire surface of spire and base marked by many equal closely and equally spaced spiral striations. Aperture oval; posterior angle obtuse; outer lip thin; columella thin, curved, with a slender fold opposite the umbilicus; parietal wall covered with a thin callus, which renders the peritreme complete.

Two specimens of this species were obtained off *Spondylus*, at Mazatlan, Mexico. Tablet 1958, Liverpool collection, British Museum, contains the largest, which has five post-nuclear whorls, and measures: Length, 1.6 mm.; diameter, 0.7 mm.

ODOSTOMIA (EVALEA) VALDEZI Dall and Bartsch.

Plate 23, fig. 6.

Odostomia (*Evalea*) *valdezi* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 526, pl. 48, fig. 2.

Shell small, thin, very elongate-oval, subdiaphanous to milk-white, having the entire surface marked by rather strong lines of growth and numerous microscopic spiral striations. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last turn is visible. Post-nuclear turns rather high between the sutures, well rounded, with narrowly roundly shouldered summits. Periphery and base of the last turn inflated and well rounded, the latter with a very narrow umbilical chink. Aperture moderately large, oval; posterior angle acute; columella strongly curved, reinforced by the attenuated base and provided with a moderately strong fold opposite the umbilical chink.

The type has five post-nuclear whorls, and measures: Length 3 mm., diameter 1.3 mm. It and another specimen (Cat. no. 196249, U.S.N.M.) were collected by Mr. S. S. Berry, in 12 fathoms, off Del Monte, Monterey, California. Two additional specimens from the same station are in Mr. Berry's collection.

ODOSTOMIA (EVALEA) NEMO, new species.

Plate 22, fig. 8.

Shell elongate-conic, milk-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls flattened in the middle, moderately contracted at the suture, and roundly shouldered at the summit. Suture strongly impressed. Periphery and base of the last whorl somewhat inflated, well rounded, the latter very frequently narrowly umbilicated. Entire surface of spire and base marked by vertical lines of growth and numerous exceedingly fine, spiral striations. Aperture ovate, somewhat effuse anteriorly; posterior angle acute; outer lip thin; columella thin, curved, strongly reflected, provided with a fold at its insertion; parietal wall glazed with a thin callus.

The type (Cat. no. 206911, U.S.N.M.) comes from San Diego, California. It has seven post-nuclear whorls and measures: Length 4.8 mm., diameter 2.1 mm.

Examinations of the following specimens have been made:

U.S.N.M. Cat. no.	No. of specimens.	Station No.	Locality.	Disposition of material.
126626	5		San Pedro, California	U. S. Nat. Mus.
206912	15		do	Do.
	29		do	Oldroyd coll.
	2	1	San Diego, California	Univ. Cal. coll.
206911	[a]1		do	U. S. Nat. Mus.

[a] Type.

ODOSTOMIA (EVALEA) IO, new species.

Plate 22, fig. 4.

Odostomia tenuis Dall and Bartsch, Mem. Cal. Acad. Sci., vol. 3, 1903, p. 287, pl. 1, fig. 14; not *Odostomia tenuis* Carpenter, 1856.

Shell regularly conic, umbilicated, white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls slightly rounded, feebly contracted at the sutures, and very faintly shouldered at the summit. Sutures poorly defined. Periphery faintly angulated. Base somewhat inflated, well rounded, narrowly umbilicated. Entire surface marked by retractive lines of growth and closely spaced spiral striations. Aperture ovate, somewhat effuse anteriorly; posterior angle acute; outer lip thin; columella slender, very strongly curved, slightly revolute, provided with a strong fold at its insertion.

The type (Cat. no. 56770, U.S.N.M.) and another specimen comes from Santa Rosa Island, California. The type has six post-nuclear whorls and measures: Length 5.6 mm., diameter 2.3 mm. Cat. no. 107741, U.S.N.M., two specimens dredged in 6 fathoms, in Santa Barbara Channel. Cat. no. 15316, U.S.N.M., one specimen from San Pedro. University of California has a specimen dredged at station 30, off Santa Catalina Island.

ODOSTOMIA (EVALEA) PRATOMA, new species.

Plate 23, fig. 4.

Shell elongate-ovate, bluish-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well rounded, strongly contracted at the sutures, with a rounded sloping shoulder at the summit. Periphery obsoletely angulated. Base well rounded with an obscure umbilical chink. Entire surface of base and spire marked by numerous, slightly retractive lines of growth and exceedingly fine, closely spaced, spiral striations. Aperture ovate; posterior angle obtuse; outer lip very thin; columella slender, strongly curved, slightly revolute, provided with a weak, deep-seated fold at its insertion.

The type (Cat. no. 206913, U.S.N.M.) and twenty-one specimens were dredged at U. S. Bureau of Fisheries station 2902, in 53 fathoms, temperature 45°, off Santa Rosa Island, California.

The type has five post-nuclear whorls and measures: Length 2.9 mm., diameter 1.4 mm. Fifteen additional specimens (Cat. no. 206914, U.S.N.M.) were dredged at U. S. Bureau of Fisheries station 2901, in 48 fathoms, temperature 55°.1, also off Santa Rosa Island.

ODOSTOMIA (EVALEA) SEPTENTRIONALIS, new species.

Plate 26, fig. 9.

Shell very elongate, ovate, thin, umbilicated, soiled yellowish white. Nuclear whorls small, smooth, very obliquely, deeply immersed in the first of the succeeding turns. Post-nuclear whorls inflated, well rounded, summits appressed, marked by fine, retractive lines of growth and numerous fine, wavy, spiral striations between the sutures and on the base. The posterior half of the base has, in addition to the above marking, three broad, low, feeble, raised, spiral threads. Umbilicus very narrow. Aperture large, very regularly oval; posterior angle obtuse, the thin outer lip bending strongly outward in a broad sweeping curve; columella long, slender, regularly curved and moderately reflected, not reënforced by the base, provided with a feeble oblique fold at its insertion; parietal wall glazed with a thin callus.

The type, Cat. no. 159462, U.S.N.M., and two additional specimens, were collected by Doctor Dall, at Unalaska, Alaska. It has five post-nuclear whorls, and measures: Length 4.3 mm., diameter 2.7 mm.

ODOSTOMIA (EVALEA) CAPITANA, new species.

Plate 26, fig. 7.

Shell elongate oval, unbilicated, light yellow. Nuclear whorls small, deeply, very obliquely immersed in the first of the succeeding turns. Post-nuclear whorls well rounded, with strongly rounded summits. Entire surface marked by fine lines of growth and exceedingly numerous, very fine, wavy, spiral striations. In addition to these markings the whorls are covered by eight very slender, subequally spaced, obsolete threads between the sutures and four which are considerably stronger and equally spaced on the base. Periphery and base of the last whorl well rounded, the latter narrowly umbilicated. Aperture rather large, broadly ovate, posterior angle acute;

outer lip thin; columella slender; very strongly curved and reflected, not reënforced by the base; parietal wall covered by a thin callus.

The type, Cat. no. 159464*b*, U.S.N.M., was collected in 25 fathoms, on sand bottom, in Captains Harbor, Unalaska, Alaska, by Dr. W. H. Dall. It has five post-nuclear whorls, and measures: Length 4.6 mm., diameter 2.5 mm. Another specimen, Cat. no. 159468, U.S.N.M., also collected by Doctor Dall, comes from 12 fathoms, mud bottom, St. Paul, Kadiak Island, Alaska.

ODOSTOMIA (EVALEA) JEWETTI Dall and Bartsch.

Plate 23, fig. 3.

Odostomia (*Evalea*) *jewetti* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 523, 524, pl. 47, fig. 3. =*Odostomia inflata* Carpenter, part, Ann. Mag. Nat. Hist., vol. 15, 1865, p. 394.

Shell elongate-ovate, white. Nuclear whorls very small, smooth, obliquely immersed in the first of the succeeding turns, above which only the last one is visible. Post-nuclear whorls well rounded, a little more abruptly so on the posterior third between the sutures. Summits very narrowly flattened which renders the sutures well marked. Periphery of the last whorl slightly angulated. Base slightly contracted, moderately rounded between the periphery and umbilical area, narrowly produced to reënforce the columella. Entire surface marked by numerous somewhat wavy, subequal and subequally spaced minute slender spiral lirations, of which there are about 35 between the summit and the periphery and an equal number between the periphery and the base on the last turn. Aperture large, patulous anteriorly; posterior angle acute, outer lip thin at the edge, thick within; columella curved, somewhat reflected, reënforced by the attenuated base, and provided with a strong oblique fold at its insertion.

The two cotypes (Cat. no. 15521*c*, U.S.N.M.) were collected by Colonel Jewett at Santa Barbara, California. One is a young specimen consisting of the nucleus and three post-nuclear whorls; the other has lost the nucleus and probably the first two post-nuclear turns; the five which remain measure: Length 6.1 mm., diameter 3.3 mm.

ODOSTOMIA (EVALEA) INFLATA Carpenter.

Plate 23, fig. 7.

Odostomia (*Evalea*) *inflata* (Carpenter) Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 524, pl. 47, fig. 8.

Shell ovate, white. Nuclear whorls decollated. Post-nuclear whorls inflated, gently curved over the anterior two-thirds of the whorl between the sutures and more strongly so on the posterior third, this portion forming an evenly curved shoulder. Extreme summit of the whorls slightly flattened and narrow, rendering the sutures well marked. Periphery of the last whorl subangulated. Base attenuated, rather suddenly contracted below the periphery, which gives the space between the periphery and the umbilical area a concave aspect. Entire surface marked by fine lines of growth and many fine, closely placed spiral lirations, five of which are a little stronger than the rest and divide the space between the sutures into subequal areas. There are about 30 of these threads upon the last turn between the summit and the periphery and about 60 on the base. Aperture very large, patulous anteriorly; outer lip thin at the edge but very thick within; columella decidedly curved, and revolute, reënforced to the very edge by the attenuated base, provided with a strong oblique fold at its insertion.

The type and a young individual (Cat no. 15521*b*) were collected by J. G. Swan at Neah Bay, Washington. It has the last four whorls (the nucleus and probably the first post-nuclear turn being lost) and measures: Length 6.2 mm., diameter 3.8 mm.

ODOSTOMIA (EVALEA) COLUMBIANA Dall and Bartsch.

Plate 23, fig. 1.

Odostomia (*Evalea*) *columbiana* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 525, pl. 47, fig. 9.

Shell large, elongate-conic, white. Nuclear whorls small, vitreous, planorboid, deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution is visible. Post-nuclear whorls increasing regularly in size, well rounded, very narrowly roundly shouldered at the summits, which renders the sutures well marked. Periphery of the last whorl somewhat inflated. Base well rounded, attenuated anteriorly to reënforce the columella. Entire surface covered by numerous somewhat wavy, subequal and subequally closely placed spiral lirations, of which about 40 occur between the summit and the periphery and about an equal number on the base of the last whorl. Aperture large, decidedly patulous anteriorly; posterior angle acute; outer lip thin at the edge, very thick within; columella curved and strongly reflected, free only at its anterior extremity, provided with a strong oblique fold at its insertion.

The type and five specimens (Cat. no. 126658, U.S.N.M.) were collected by Dr. C. F. Newcombe at Victoria, Vancouver Island, British Columbia. It has six post-nuclear whorls and measures: Length 8.3 mm., diameter 4.2 mm. Three other specimens (Cat. no. 196245, U.S.N.M.) were dredged by the Bureau of Fisheries steamer *Albatross* at station 4213, off Port Townsend, Washington, in 23 to 25 fathoms, gray sand and broken shell, bottom temperature 51°. Another (Cat. no. 196246, U.S.N.M.) at stationat 4203, Fort Rupert, British Columbia, in 25 to 30 fathoms, volcanic sand and gravel and broken shell and sponge, bottom temperature 49°.1.

ODOSTOMIA (EVALEA) UNALASKENSIS, new species.

Plate 26, fig. 5.

Shell elongate-ovate, stout and strong, light yellow. (Nuclear whorls decollated.) Post-nuclear whorls flattened on their outer three-fourth, rounding suddenly to the closely appressed summit, on the posterior fourth. Entire surface of the shell marked by lines of growth and numerous equal and equally spaced, well marked spiral striations, of which about 28 occur between the sutures of the penultimate whorl. Sutures well impressed. Periphery of the last whorl somewhat angulated. Base elongated, rounded, marked like the spire. Aperture ovate, slightly effuse anteriorly, posterior angle acute; outer lip thin; columella short, strongly curved and reflected, reënforced for the greater part by the attenuated base and provided with a strong oblique fold at its insertion; parietal wall covered by a thin callus.

The unique type, Cat. no. 150464*a*, was collected by Dr. W. H. Dall, at Captains Harbor, Unalaska, Alaska. It has five and one-half post-nuclear turns and measures: Length 4.8 mm., diameter 2.8 mm.

ODOSTOMIA (EVALEA) ATOSSA Dall.

Plate 26, fig. 8.

Odostomia (*Evalea*) *atossa* Dall, Proc. U. S. Nat. Mus., vol. 34, p. 253, June, 1908.

Shell large, ovate, bluish-white. Nuclear whorls small, deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls inflated, well rounded, feebly contracted at the sutures, very weakly shouldered at the summit, marked by fine, slightly retractive lines of growth, and by 7 well-incised spiral lines on the first, 10 on the second, and 20 on the third. On the last whorl they are very feeble between the sutures, where they are replaced by four slender, spiral threads. Periphery of the last whorl inflated. Base inflated, well rounded, marked by numerous, closely spaced, fine spiral striations. Aperture large, ovate; posterior angle acute; outer lip thin; columella moderately strong, strongly curved, decidedly reflected, partly reënforced by the base and provided with a fold at its insertion.

The type (Cat. no. 110637, U.S.N.M.) and another specimen comes from San Pedro, California. The type has five post-nuclear whorls and measures: Length 6.5 mm., diameter 3.5 mm., and was collected by Mr. H. N. Lowe.

ODOSTOMIA (EVALEA) OBESA, new species.

Plate 26, fig. 4.

Shell large, ovate, yellowish-white. Nuclear whorls very small, very deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls inflated, very strongly rounded, weakly contracted at the sutures, appressed at the summit, marked by numerous, very retractive, lines of growth, and on the first three whorls by strongly incised spiral lines, of which 6 occur upon the first, 17 upon the second, 25 upon the third whorl between the sutures, while on the last whorl they are less strongly expressed and more numerous. Periphery and base of the last whorl inflated, well rounded, marked like the space between the sutures of the last whorl. Aperture broadly ovate; posterior angle acute; outer lip thin, decidedly expanded anteriorly; columella short, strongly curved, revolute, reënforced by the base and provided with a deep-seated fold at its insertion.

The type (Cat. no. 206915, U.S.N.M.) and eight specimens come from San Pedro, California. The type has five post-nuclear whorls and measures: Length 6 mm., diameter 3.5 mm.

ODOSTOMIA (EVALEA) LUCASANA, new species.

Plate 26, fig. 2.

Shell broadly oval, light yellow. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns. Post-nuclear whorls inflated, weakly contracted at the sutures, appressed at the summits, the first marked by several slender strongly incised spiral lines, the remaining with numerous very fine closely crowded, wavy, spiral striations. Suture well impressed. Periphery and base of the last whorl well inflated, marked like the space between the sutures. Aperture very large, very broadly ovate; posterior angle acute; outer lip thin; columella stout, strongly curved, reflected, reenforced by the base and provided with a strong fold at its insertion.

The type (Cat. no. 16220, U.S.N.M.) comes from Cape St. Lucas, Lower California. It has five post-nuclear whorls and measures: Length 4.7 mm., diameter 3.2 mm.

ODOSTOMIA (EVALEA) PHANEA Dall and Bartsch.

Plate 23, fig. 5.

Odostomia (*Evalea*) *phanea* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 528, pl. 48, fig. 7. =*Odostomia* (*Evalea*) *gouldi* Dall and Bartsch, Mem. Cal. Acad. Sci., 1903, p. 282, pl. 1, fig. 15, not *Odostomia* (? var.) *gouldii* Carpenter, Ann. Mag. Nat. Hist., 3d ser., vol. 15, 1865, p. 30 (=*Odostomia* (*Amaura*) *gouldi* Carpenter, of the present paper).

Shell elongate-ovate, subdiaphanous to milk-white, stout and shining. Nuclear whorls small, deeply immersed in the first of the succeeding turns. Post-nuclear whorls rather high between the sutures, well rounded with scarcely an indication of a shoulder at the summit, separated by well-marked sutures. Periphery and the rather long base of the last whorl well rounded. The first two whorls are regularly closely spirally striated, in the third striation becomes enfeebled and on the penultimate decidedly obsolete, while the base is smooth. About 18 of the striæ are visible on the third turn. Aperture large, oval, somewhat effuse anteriorly; columella decidedly curved and reflected, reënforced by the attenuated base, provided with a strong oblique fold at its insertion.

The type has five post-nuclear whorls and measures: Length 4.8 mm., diameter 2.6 mm. It and another specimen (Cat. no. 46408, U.S.N.M.) belong to the Stearns collection and come from Monterey, California.

There are four other lots in the collection of the U. S. National Museum, all from Monterey. Cat. no. 46496, one specimen belongs to the Stearns collection; Cat. nos. 46474 and 46479, one specimen each collected by Doctor Canfield, and Cat. no. 159459, two collected by Doctor Dall.

ODOSTOMIA (EVALEA) PHANELLA, new species.

Plate 23, fig. 9.

Shell ovate, vitreous, translucent. Nuclear whorls deeply, very obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls inflated, slightly contracted at the suture, appressed at the summit, marked by 8 strongly incised spiral lines on the first and second and 20 upon the third, between the sutures. Suture well marked. Periphery and base of the last whorl well rounded, marked by numerous spiral striations, which are a little weaker than those between the periphery and summit of the last whorl. Aperture oval; posterior angle obtuse; outer lip thin; columella moderately strong, decidedly curved and strongly revolute, provided with a strong fold at its insertion.

The type (Cat. no. 196348, U.S.N.M.) comes from San Pedro Bay. It has four post-nuclear whorls and measures: Length 3.3 mm., diameter 1.7 mm. One specimen (Cat. no. 162676, U.S.N.M.) from La Jolla and one specimen (Cat. no. 152324, U.S.N.M.) from Ballast Point, San Diego.

ODOSTOMIA (EVALEA) SANTAROSANA, new species.

Plate 26, fig. 6.

Shell elongate-ovate, light olive. Nuclear whorls very deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls much broader at the moderately constricted suture than at the feebly shouldered summit; well rounded. The first 4 are marked by strongly incised spiral lines, of which 7 occur upon the second, 10 upon the third, and 13 upon the fourth, of which the 5 immediately below the summit are finer and closer spaced than the rest, which are equal. The entire surface of the last whorl is marked by numerous very fine, closely spaced, wavy, spiral striations. Suture well impressed. Periphery and base of the last whorl inflated and well rounded. Aperture oval; posterior angle acute; outer lip thin; columella moderately strong, decidedly curved, somewhat reflected, reënforced by the base, provided with a fold at its insertion.

The type (Cat. no. 56770 U.S.N.M.) comes from Santa Rosa Island. It has six post-nuclear whorls and measures: Length 4.9 mm., diameter 2.7 mm.

ODOSTOMIA (EVALEA) TENUISCULPTA Carpenter.

Plate 23, fig. 2.

Odostomia tenuisculpta Carpenter, 2d Rept. Brit. Assoc. Adv. Sci., 1864, p. 659; Ann. Mag. Nat. Hist., vol. 15, 1865, p. 30. +*Odostomia straminea* Carpenter, Journ. de Conch., vol. 13, 1865, p. 146–147. *Odostomia* (*Evalea*) *tenuisculpta* (Carpenter), Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 527, pl. 47, fig. 6.

Shell elongate-ovate, yellowish, with the early whorls spirally lirate and the later ones only obsoletely so. Nuclear whorls small, smooth, obliquely, almost completely, immersed in the first of the succeeding turns. Post-nuclear whorls evenly well-rounded with appressed summits. The first three marked between the sutures by many subequal liræ of which there are about fifteen on the second turn. On the last two turns these lirations become quite obsolete. Periphery and base of the last whorl inflated and well rounded, marked by very feeble spiral striation and lines of growth. Aperture moderately large, oval; somewhat effuse anteriorly; posterior angle acute; outer lip thin; columella strongly curved, reënforced partly by the attenuated base, moderately reflected anteriorly, bearing a strong fold at its insertion, which appears as if it were the inflected termination of the columella.

Doctor Carpenter's type (Cat. no. 15520, U.S.N.M.) is a young individual. It was collected by J. G. Swan at Neah Bay, Washington, has three post-nuclear whorls, and measures: Length 2.3 mm., diameter 1.7 mm. The adult characters were described from two specimens (Cat. no. 46483, U.S.N.M.) collected by J. G. Swan at Neah Bay, Washington. One of these, the one figured, has six post-nuclear whorls and measures: Length 5.3 mm., diameter 2.9 mm. A specimen collected by Merrihew (Cat. no. 196247, U.S.N.M.), at Port Harford, California, bears a slender raised cord on the periphery of the whorl.

The large series of specimens in the U. S. National Museum proves conclusively that *O. straminea* Carpenter is the smooth southern representative of this species.

The U. S. National Museum has the following material:

No. of specimens.	Locality.	Collector.	Catalogue No.
1	Neah Bay, Washington	J. G. Swan	15520 U.S.N.M.
2	do	do	46483 U.S.N.M
75	Little River, Mendocino County, California.	G. W. Harford	46486 U.S.N.M.
6	Gualala, Mendocino County, California	Stearns collection	101945 U.S.N.M.
2	San Francisco Bay, California	Doctor Hewston	74006 U.S.N.M.
30	Monterey, California	Stearns collection	46482 U.S.N.M.
30	do	do	46485 U.S.N.M.
30	do	do	46493 U.S.N.M.
21	do	do	46489 U.S.N.M.
2	do	do	46491 U.S.N.M.
4	do	P. P. Carpenter	46476 U.S.N.M.
1	do	W. H. Dall	159475 U.S.N.M.
17	do	do	159477 U.S.N.M.
5	do	do	159478 U.S.N.M.
13	do	do	159479 U.S.N.M.
1	do		159480 U.S.N.M.

ODOSTOMIA (EVALEA) ANGULARIS Dall and Bartsch.

Plate 24, fig. 6.

Odostomia (*Evalea*) *angularis* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 523, pl. 47, fig. 2.

Shell very regularly elongate-conic, subdiaphanous to milk-white. Nuclear whorls small, deeply obliquely immersed in the first of the succeeding turns, above which the tilted edge of the last turn only is visible. Post-nuclear whorls slightly rounded, separated by constricted sutures, marked by numerous slender, wavy, subequal and subequally closely spaced spiral striations, of which about 33 occur upon the last turn between the summit and the periphery. Periphery of the last whorl marked by a slender raised keel, decidedly angulated. Base short, moderately rounded, narrowly attenuated anteriorly to reënforce the columella, sculptured like the posterior portion of the whorls. Aperture ovate, very broad, slightly effuse anteriorly; posterior angle acute; columella very slender, evenly curved, closely appressed to the attenuated base, with a strong fold at its insertion, which is barely visible when the aperture is viewed squarely.

The type has seven post-nuclear whorls and measures: Length 5.6 mm., diameter 2.8 mm. It and four additional specimens (Cat. no. 150565, U.S.N.M.) were collected by Rev. G. W. Taylor at Nanaimo, British Columbia.

Five other lots are in the collection of the U. S. National Museum; Cat. no. 159474, one, collected by Doctor Dall at Sitka Harbor, Alaska; Cat. no. 126664, three specimens collected by Dr. C. F. Newcombe at Victoria, Vancouver Island, British Columbia; Cat. no. 43384, one specimen from Puget Sound; Cat. no. 161624, four from Port Harford, California, collected by Mrs. Merrihew; Cat. no. 196300, one, dredged by the Bureau of Fisheries steamer *Albatross* at station 3194, off the California coast, in 92 fathoms, gray sand, bottom temperature 45°.9; eighteen specimens were determined for Mr. S. S. Berry from 12 fathoms off Del Monte, Monterey Bay, California.

ODOSTOMIA (EVALEA) SOCORROENSIS, new species.

Plate 24, fig. 1.

Shell ovate, light yellow. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well rounded, moderately contracted at the sutures, appressed at the summit. Suture strongly impressed. Periphery of the last whorl feebly angulated. Base rather long, slightly rounded. Entire surface of spire and base marked by very numerous, closely crowded, exceedingly fine spiral striations. Aperture ovate; posterior angle with a decided notch; outer lip strongly arcuate, thin; columella slender, curved, slightly revolute, provided with a fold at its insertion.

The type (Cat. no. 153024, U.S.N.M.) and 84 specimens come from Socorro Island, Mexico. The type has six post-nuclear whorls and measures: Length 4.6 mm., diameter 2.2 mm.

ODOSTOMIA (EVALEA) DONILLA, new species.

Plate 24, fig. 3.

Shell broadly conic, bluish-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well rounded, slightly contracted at the suture, appressed at the summit. Periphery of the last whorl angulated. Base slightly rounded, sloping abruptly from the periphery to the umbilical area. Suture slightly impressed. Entire surface of base and spire marked by numerous almost vertical lines of growth and many well-incised spiral striations. Aperture ovate, slightly effuse anteriorly; posterior angle acute; outer lip thin; columella strongly curved, reflected, reënforced by the base, provided with a strong fold at its insertion.

The type (Cat. no. 126626, U.S.N.M.) and eight specimens come from San Pedro, California. The type has six post-nuclear whorls and measures: Length 4.5 mm., diameter 2.2 mm. Cat. no. 152324, U.S.N.M., two specimens from Ballast Point, California. Cat. no. 46470, U.S.N.M., two specimens from Todos Santos Bay, Lower California. Cat. no. 46497, U.S.N.M., one from the same locality. Eight specimens were identified for Mrs. Oldroyd, from San Pedro Bay, California.

ODOSTOMIA (EVALEA) CALIFORNICA, new species.

Plate 24, fig. 2.

Shell small, broadly conic, bluish-white. Nuclear whorls deeply very obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects, the whole giving the spire a decidedly truncated effect. Post-nuclear whorls moderately rounded, feebly contracted at the suture, appressed at the summit, through which the preceding whorl shines, which gives the summit the effect of having a double suture. Suture moderately impressed. Periphery of the last whorl inflated, weakly angulated. Base short, sloping in a gentle curve from the periphery to the umbilical area. Entire surface of spire and base marked by decidedly retractive lines of growth and numerous well-incised spiral striations. Aperture large, ovate; posterior angle acute; outer lip thin; columella strongly curved, slightly reflected, reënforced by the narrow base, and provided with a strong deep-seated fold at its insertion.

The type (Cat. no. 206916, U.S.N.M.) comes from Ocean Beach, California. It has six post-nuclear whorls and measures: Length 3 mm., diameter 1.5 mm. Another specimen (Cat. no. 153056, U.S.N.M.) comes from the government jetty at San Diego, California.

ODOSTOMIA (EVALEA) SERILLA, new species.

Plate 24, fig. 9.

Shell elongate-conic, white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the titled edge of the last volution projects. Post-nuclear whorls well rounded, rather high between the sutures, contracted at the periphery, strongly, narrowly tabulately shouldered at the summit. Suture strongly marked. Periphery of the last whorl and the rather long base well rounded. Entire surface of spire and base marked by numerous lines of growth and well-incised spiral striations. Aperture ovate, posterior angle acute; outer lip thin; columella strongly curved, slightly revolute, provided with a fold at its insertion.

The type (Cat. no. 206917, U.S.N.M.) comes from University of California station 59, off San Diego. It has six post-nuclear whorls and measures: Length 4.8 mm., diameter 2 mm.

ODOSTOMIA (EVALEA) TACOMAENSIS Dall and Bartsch.

Plate 24, fig. 8.

Odostomia (*Evalea*) *tacomaensis* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 526, pl. 47, fig. 10.

Shell ovate, yellowish. Nuclear whorls small, deeply immersed in the first of the succeeding turns. Post-nuclear whorls well rounded, faintly roundly shouldered at the extreme summits. Periphery of the last whorl rounded. Base inflated, well rounded, somewhat attenuated anteriorly. Surface covered by numerous equal and equally closely spaced slender wavy spiral striations, of which there are about forty between the summit and the periphery of the last whorl. Base marked like the space posterior to it. In addition to the spiral sculpture the entire surface of the shell is crossed by numerous fine lines of growth.

Aperture moderately large, oval, well rounded anteriorly; posterior angle acute; outer lip thin; columella curved, slightly reflected, reënforced, except at its extreme anterior end, by the attenuated base and provided with a strongly oblique fold at its insertion.

The type (Cat. no. 159267, U.S.N.M.) has five post-nuclear whorls and measures: Length 4.3 mm., diameter 2.5 mm. It was collected by Mr. Fisher at Tacoma, Washington.

ODOSTOMIA (EVALEA) AMCHITKANA, new species.

Plate 24, fig. 7.

Shell broadly conic, thin, semitranslucent, bluish-white. Nuclear whorls very obliquely immersed in the first of the succeeding turns, above which only the last half of the last turn is visible. Post-nuclear whorls well rounded, faintly shouldered at the summit, marked by fine lines of growth and numerous very fine equal and equally spaced spirally incised lines, of which there are probably more than forty between the periphery and the summit of the last turn. Sutures rendered subchanneled by the slight shoulder at the summit of the whorls. Periphery and base of the last whorl well rounded, the latter somewhat attenuated and marked like the spaces between the sutures. Aperture large, broadly pear-shaped, posterior angle obtuse; outer lip broadly recurved, thin, showing the fine external striation within; columella slender, curved, and revolute; reënforced by the attenuated base and provided with a weak fold at its insertion, which is not visible when the aperture is viewed squarely; parietal wall glazed with a thin callus.

The type (Cat. no. 161088, U.S.N.M.) and another specimen were collected by Doctor Dall at Constantine Harbor, Amchitka Island, Alaska. It has five post-nuclear whorls and measures: Length 3.3 mm., diameter 1.7 mm.

Six specimens, collected by Mrs. Kate Stephens at Bear Bay, Peril Straits, Baranoff Island, Alaska, agree well with the present species. Two of these form Cat. no. 204013, U.S.N.M.

ODOSTOMIA (EVALEA) STEPHENSI, new species.

Plate 24, fig. 5.

Shell elongate-conic, bluish-white. Nuclear whorls almost completely obliquely immersed in the first of the succeeding turns, above which only the outer edge of the last volution projects. Post-nuclear whorls rather high between the sutures, moderately rounded, ornamented by numerous fine but well incised subequal and subequally spaced spiral lines; about thirty-three of which appear between the summit and the periphery of the last whorl. Suture well marked. Periphery of last whorl well rounded. Base rather prolonged, well rounded, its entire surface marked by incised spirals like the spaces between the sutures. In addition to the spiral markings the entire surface shows fine incremental lines. Aperture elongate-oval, effuse at the junction of the outer lip and the columella; posterior angle obtuse; outer lip thin; columella stout, curved, and decidedly reflected over the reënforced base, provided with a strong oblique fold opposite the obsolete umbilical chink; parietal wall covered with a thin callus.

The type (Cat. no. 204010, U.S.N.M.) has six post-nuclear whorls and measures: Length 5.3 mm., diameter 2.6 mm. It and eight additional specimens were collected by Mrs. Kate Stephens at Bear Bay, Peril Straits, Baranoff Island, Alaska. Two in addition to the type were listed under the same number as the type in the U. S. National Museum. The rest are in Mrs. Stephens's collection.

Named for Mrs. Kate Stephens.

ODOSTOMIA (EVALEA) CLESSINI, new species.

Plate 24, fig. 4.

Shell elongate-ovate, rather thick, yellowish-white. Nuclear whorls small, very obliquely immersed in the first of the succeeding turns, above which the edge of only about two-thirds of the last nuclear whorl project. Post-nuclear turns very high between the sutures, moderately rounded, marked by lines of growth and fine, irregular and irregularly distributed incised spiral lines. Suture well impressed. Periphery and base of the last whorl well rounded, marked like the spaces between the sutures. Aperture pear-shaped, posterior angle acute; outer lip rather thick within, thin at the edge; columella short, stout, curved, reflected, reënforced by the base and provided with a strong oblique fold at its insertion; parietal wall covered by a thin callus.

The type (Cat. no. 204014, U.S.N.M.) has lost the nucleus and probably the first post-nuclear whorl. The five turns remaining measure: Length 6 mm., diameter 2.9 mm. This and another specimen listed under the same number were donated by Mrs. Kate Stephens, who collected them and seven others at Bear Bay, Peril Straits, Baranoff Island, Alaska. Five additional specimens, two of which (Cat. no. 204015, U.S.N.M.) were collected by her at Hawk Inlet, Alaska, and one more at Mole Harbor, Alaska. Two others (Cat. no. 159461, U.S.N.M.) were collected by Doctor Dall at Sitka, Alaska.

Named for T. Clessin.

ODOSTOMIA (EVALEA) MINUTISSIMA, new species.

Plate 25, fig. 4.

Shell very small, very regularly narrowly conic, bluish-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls slightly rounded, feebly contracted at the sutures, and very narrowly tabulately shouldered at the summit. The spiral thread at the periphery and the narrow tabulated summits, which fall a little anterior to this, render the suture narrowly channeled. Periphery of the last whorl marked by a slender raised thread. Base short, well rounded, impressed at the umbilical area. Entire surface of spire and base marked by slightly protractive lines of growth and many very fine, closely spaced spiral striations. Aperture rhomboidal, posterior angle obtuse; outer lip thin: columella slender, curved, slightly revolute, provided with a strong fold at its insertion.

The type (Cat. no. 206918, U.S.N.M.) and five specimens come from San Diego, California. The type has six post-nuclear whorls and measures: Length 3.1 mm., diameter 1.3 mm. Two additional specimens (Cat. no. 206919, U.S.N.M.) come from San Hipolito Point, Lower California, and three more (Cat. no. 105484, U.S.N.M.) from Point Abreojos, Lower California.

ODOSTOMIA (EVALEA) RAYMONDI, new species.

Plate 25, fig. 9.

Shell regularly conic, milk-white. Nuclear whorls very obliquely deeply immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects, which gives the spire a decidedly truncated aspect. Post-nuclear whorls well rounded, slightly shouldered at the summit, marked by a raised spiral thread at the decidedly angulated periphery. The summits of the whorls fall a little anterior to the periphery, and cause the sutures to appear subchanneled. Base short, well rounded. Entire surface of base and spire marked by strongly retractive lines of growth and numerous closely spaced spiral striations. Aperture oval; posterior angle acute; outer lip thin; columella curved, reflected, reënforced by the base and provided with a moderately strong fold at its insertion.

The type (Cat. no. 206920, U.S.N.M.) was dredged by the University of California, at station 30, off Catalina Island. It has six post-nuclear whorls and measures: Length 3.6 mm., diameter 1.6 mm. A topotype is in the University of California collection.

This species resembles *Odostomia* (*Evalea*) *minutissima*, but is much broader with a stronger peripheral keel and with an oval instead of rhomboidal aperture.

Named for Prof. William J. Raymond.

ODOSTOMIA (EVALEA) GRAVIDA Gould.

Plate 25, fig. 7.

Odostomia gravida GOULD, Proc. Bost. Soc. Nat. Hist., vol. 6, 1852, p. 376.

Shell large, broadly conic, milk-white, shining. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, somewhat shouldered at the summit, marked by fine lines of growth and numerous, very fine, closely spaced spiral striations. Sutures well impressed. Periphery of the last whorl somewhat angulated. Base sloping from the periphery to the umbilical area, but slightly rounded. Aperture ovate; posterior angle obtuse; outer lip fractured; columella short, strong, curved, and revolute, provided with a strong fold at its insertion; parietal wall covered with a weak callus.

The type (Cat. no. 44, State Museum, Albany, New York (original no. 24), A 31, 10) was collected at Santa Barbara, California. It has seven post-nuclear whorls and measures: Length 6.6 mm., diameter 3 mm.

ODOSTOMIA (EVALEA) NOTILLA, new species.

Plate 25, fig. 6.

Shell very elongate, ovate, yellowish-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well rounded, feebly contracted at the sutures, narrowly subtabulately shouldered at the summit. Suture strongly marked. Periphery of the last whorl marked by a low raised cord, which renders it decidedly angulated. Base short, well rounded, somewhat pinched in at the umbilical area. Entire surface of spire and base marked by almost vertical lines of growth and numerous very fine, well incised, spiral striations. Aperture ovate, posterior angle acute; outer lip thin; columella slender, slightly curved, provided with a fold at its insertion; parietal wall covered with a thick callus.

The type (Cat. no. 206921, U.S.N.M.) was dredged by the University of California, at station 30, off Catalina Island, California. It has five post-nuclear whorls and measures: Length 2.7 mm., diameter 1.3 mm. The topotype is in the University of California.

ODOSTOMIA (EVALEA) MOVILLA, new species,

Plate 25, fig. 1.

Shell elongate-ovate, white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls feebly rounded in the middle, strongly so at the slopingly shouldered summit, and moderately contracted at the suture. Periphery weakly angulated. Base rather long, moderately rounded, sloping gently from the periphery to the umbilical area. Suture well impressed. Entire surface of spire and base marked by fine retractive lines of growth and numerous very fine closely spaced wavy spiral striations. Aperture broadly oval, posterior angle obtuse; outer lip thin; columella slender, very strongly curved, very oblique, provided with a deep seated fold at its insertion; parietal wall covered with a thin callus.

The type (Cat. no. 206922, U.S.N.M.) and seven specimens were dredged at U. S. Bureau of Fisheries, station 2936, in 359 fathoms, temperature 49°, off San Diego, California. It has five post-nuclear whorls and measures: Length 3.6 mm., diameter 1.7 mm.

ODOSTOMIA (EVALEA) ALTINA, new species.

Plate 25, fig. 2.

Shell ovate, white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well rounded, feebly contracted at the suture, appressed at the summit. Suture slightly impressed. Periphery obscurely angulated. Base well rounded. Entire surface marked by slightly retractive lines of growth and exceedingly fine spiral striations. Aperture ovate, posterior angle acute; outer lip thin; columella strongly curved, decidedly revolute, provided with a strong fold at its insertion.

The type (Cat. no. 206923, U.S.N.M.) and two additional specimens were dredged at U. S. Bureau of Fisheries, station 2936, in 359 fathoms, temperature 49°, off San Diego, California. The type has five post-nuclear whorls and measures: Length 3 mm., diameter 1.5 mm.

ODOSTOMIA (EVALEA) PROFUNDICOLA, new species.

Plate 25, fig. 8.

Shell turrited, milk-white. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, slightly contracted at the sutures, broadly tabulately shouldered at the summit. Periphery and base of the last whorl somewhat inflated, strongly rounded. Entire surface of spire and base marked by numerous vertical lines of growth and exceedingly fine microscopic, closely spaced, spiral striations. Aperture very large, ovate; posterior angle obtuse; outer lip thin; columella slender, somewhat twisted, oblique, slightly revolute, provided with a deep-seated fold.

The type (Cat. no. 206924, U.S.N.M.) and eight specimens were dredged at U. S. Bureau of Fisheries, station 2936, in 359 fathoms, temperature 49°, off San Diego, California. The type has six post-nuclear whorls and measures: Length 4.5 mm., diameter 2 mm. The University of California has a specimen dredged at station 13, off Point Vincente.

ODOSTOMIA (EVALEA) BARANOFFENSIS, new species.

Plate 25, fig. 3.

Shell elongate-ovate, rather stout, yellowish-white. Nuclear whorls obliquely immersed in the first of the succeeding turns, the outer edge of the last turn only being visible. Post-nuclear whorls well rounded, with a narrow, tabulate shoulder at the summit. Suture rendered subchanneled by the shoulder at the summit of the whorls. Periphery and base of the last whorl inflated, well rounded, the latter with a depressed pit, but no perforation in the umbilical area. Entire surface marked by lines of growth and very fine spiral striations. Aperture ear-shaped; posterior angle obtuse; outer lip thick within, thin at the edge; columella very stout, twisted and obliquely revolute, armed with a thick oblique fold opposite the umbilical chink; parietal wall covered by a thin callus.

The type (Cat. no. 204011, U.S.N.M.) has six post-nuclear whorls and measures: Length 6.3 mm., diameter 2.8 mm. It and two additional specimens were collected by Mrs. Kate Stephens at Bear Bay, Peril Straits, Baranoff Island, Alaska. Two additional specimens were obtained by the same collector at Mole Harbor, Admiralty Island, Alaska; one of them forms Cat. no. 204012, U.S.N.M.

ODOSTOMIA (EVALEA) SITKAENSIS Clessin.

Plate 26, fig. 3.

Odostomia sitkaensis Clessin, Martini Chemnitz Conch. Cab., 2d ed., Pyramidellidæ, 1900, p. 121, vol. 30, fig. 1. *Odostomia* (*Evalea*) *sitkaensis* Clessin, Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1906, p. 360, pl. 17, fig. 8.

Shell elongate-conic, very regular in outline, yellowish white, shining. Nuclear whorls almost completely immersed in the first of the succeeding volutions. Post-nuclear whorls moderately rounded, rather high between the sutures, slightly shouldered at the summits, marked by many fine lines of growth and numerous fine wavy spiral striations; the latter are more regularly developed and distributed than the lines of growth. (Our figure does not show the spiral markings.) The periphery of the last whorl marks the greatest diameter of the shell. The base, though rather long, falls off rather abruptly at the periphery, then tapers gradually to the anterior end of the columella; it is marked like the spaces between the sutures. Aperture large, oval; posterior angle acute, outer lip decidedly curved, almost patulous, thin; columella long, slender, gently curved, and somewhat reflected, provided with a moderately strong, oblique fold near its insertion; parietal wall without callus.

The Berlin collection contains two specimens of this species, No. 26232, which were collected by F. Schmidt, at Sitka, Alaska. We have described and figured the most perfect of the two, which we consider Clessin's type. This specimen measures: Length 4 mm., diameter 2 mm. Clessin's figure is worthless.

ODOSTOMIA (EVALEA) HAGEMEISTERI, new species.

Plate 26, fig. 1.

Shell small, elongate ovate, yellowish white. Nuclear whorls small, almost completely immersed in the first of the succeeding turns. Post-nuclear whorls moderately well rounded, with rounded summits, marked by retractive lines of growth and many fine, closely placed spiral striations. Suture well impressed. Periphery of last whorl well rounded. Base well rounded, marked like the spire. Aperture ovate, posterior angle acute; outer lip thick within, thin at edge; columella very short, very strongly curved, somewhat revolute, reënforced by the attenuated base and provided with a strong fold at its insertion.

The unique type (Cat. no. 159469, U.S.N.M.) was collected by Dr. William H. Dall at low-water mark at Hagemeister Island, Bering Sea. It has five post-nuclear whorls and measures: Length 4.4 mm., diameter 2.4 mm. The fine spiral striations have been omitted in the drawing.

ODOSTOMIA (EVALEA) RESINA, new species.

Plate 27, fig. 6.

Shell very small, vitreous, transparent. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls inflated, strongly rounded, decidedly contracted at the suture, and appressed at the summit, where the preceding whorl is reflected through it, and gives the summit the false appearance of having a spiral cord. Suture strongly constricted. Periphery and base of the last whorl well rounded. Entire surface of the shell marked by lines of growth which are of varying strength, and numerous closely spaced, exceedingly fine, spiral striations. Aperture ovate, posterior angle acute; outer lip thin, showing the external sculpture within; columella slender, strongly curved, slightly revolute, reënforced by the base, provided with a fold at its insertion.

The type (Cat. no. 206925, U.S.N.M.) comes from Arch Beach, California. It has five post-nuclear whorls and measures: Length 2.2 mm., diameter 1 mm.

ODOSTOMIA (EVALEA) DELICIOSA Dall and Bartsch.

Plate 25, fig. 5.

Odostomia (*Evalea*) *deliciosa* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 525, 526, pl. 47, fig. 5.

Shell small, elongate-conic, translucent to milk-white. Nuclear whorls small, deeply immersed in the first of the succeeding turns, above which only a portion of the last turn is visible. Post-nuclear whorls moderately rounded, very weakly roundly shouldered at the summit, separated by a strongly marked suture; a narrow band appears about the summit showing its junction with the preceding turn. Periphery and base of the last whorl inflated and well rounded. Entire surface of base and spire marked by very fine lines of growth and numerous microscopic wavy spiral striations. Aperture rather large, somewhat effuse anteriorly; posterior angle acute; outer lip thin; columella rather stout, strongly curved, and revolute, reënforced by the attenuated base, and covered with a strong fold at its insertion. This fold can be seen through the transparent shell as a quite strong lamella on the pillar of the turns.

The type (Cat. no. 46492, U.S.N.M.) is from Monterey, has $6\frac{1}{2}$ post-nuclear whorls and measures: Length 4 mm., diameter 1.9 mm. Another specimen (Cat. no. 196301, U.S.N.M.) also comes from Monterey, California.

ODOSTOMIA (EVALEA) PARELLA, new species.

Plate 27, fig. 5.

Shell elongate-conic, pale yellow. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle between the sutures, strongly contracted at the periphery, moderately roundly shouldered at the summit, marked by rather strong lines of growth and exceedingly fine, closely spaced, microscopic spiral striations. Suture strongly contracted. Periphery and base of the last whorl well rounded, the latter slightly inflated, marked like the spire. Aperture ovate; posterior angle acute; outer lip thin; columella very strongly curved, somewhat revolute, reënforced by the base, provided with a fold at its insertion.

The type (Cat. no. 206926, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2808, in 634 fathoms, temperature 39.9°, near the Galapagos Islands. It has the last five whorls remaining which measure: Length 3.7 mm., diameter 1.6 mm. It has lost the nucleus and probably the first two succeeding turns.

ODOSTOMIA (EVALEA) GRANADENSIS, new species.

Plate 27, fig. 4.

Shell very slender, ovate-conic, white, with a narrow, faint yellow band a little posterior to the middle between the sutures. Nuclear whorls very deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls flattened, slightly contracted at the sutures, and feebly shouldered at the summits. Periphery and base of the last whorl well rounded, the latter somewhat attenuated. Entire surface of spire and base marked by many fine, closely spaced, wavy spiral striations, which are considerably stronger on the base than between the sutures. Aperture ovate; posterior angle acute; outer lip thin; columella short, slender, curved and feebly revolute, provided with a fold at its insertion.

The type (Cat. no. 206927, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2794, off Panama Bay, in 62 fathoms, sand, temperature 59°.5. It has five post-nuclear whorls and measures: Length 2.7 mm., diameter 1 mm.

Subgenus **AMAURA** Möller.

Amaura Möller, Index Moll. Groenlandica, 1842, p. 7.

Very large, usually inflated Odostomias, the sculpture of which consists of very fine lines of growth and still finer wavy closely placed spiral striations.

Type.—*Amaura candida* Möller.

KEY TO THE SPECIES OF THE SUBGENUS AMAURA.

- Shell umbilicated.
  - Shell very large, adult more than 10 mm. long.
    - Shell very elongate-ovate .... *lastra*, p. 219.
    - Shell broadly ovate .... *kennerleyi*, p. 219.
  - Shell less than 10 mm. long.
    - Shell ovate.
      - Summit of the whorls concavely shouldered .... *elsa*, p. 220.
      - Summit of the whorls narrowly flatly shouldered .... *beringi*, p. 220.
    - Shell very elongate-ovate.
      - Umbilicus rather wide.
        - Summit of the whorls with a faint shoulder .... *satura*, p. 221.
        - Summit of the whorls with a strongly tabulated shoulder .... *farallonensis*, p. 221.
      - Umbilicus very narrow.
        - Summit of the whorls appressed .... *sillana*, p. 222.
        - Summit of the whorls shouldered.
          - Shoulder concave .... *talpa*, p. 222.
          - Shoulder narrowly tabulated.
            - Whorls strongly contracted at the suture .... *krausei*, p. 223.
            - Whorls not strongly contracted at the suture.
              - Adult shell 7.8 mm. long .... *orcia*, p. 223.
              - Adult shell 6.1 mm. long .... *gouldi*, p. 224.
- Shell not umbilicated.
  - Shell very large, adult more than 12 mm. long .... *arctica*, p. 224.
  - Shell less than 10 mm. long.
    - Shell elongate-ovate.
      - Summit of the whorls appressed .... *avellana*, p. 225.
      - Summit of the whorls not appressed.
        - Columella free for its entire length.
          - Shell finely spirally lirate .... *moratora*, p. 225.
          - Shell not finely spirally lirate.
        - Shell large and robust, adult 9.3 mm. long .... *pesa*, p. 226.
        - Shell of medium size, not robust, adult 7.5 mm. long .... *nota*, p. 226.
      - Columella free only in its anterior half .... *iliuliukensis*, p. 227.

Shell not umbilicated—Continued.
  Shell less than 10 mm. long—Continued.
    Shell ovate.
      Summit of the whorls appressed . . . . *nuciformis*, p. 227.
      Summit of the whorls tabulated.
      Adult shell more than 9 mm. long. . . . .*canfieldi*, p. 228.
      Adult shell less than 7 mm. long . . . . *subturrita*, p. 228.
    Shell very broadly ovate. . . . .*martensi*, p. 229.

ODOSTOMIA (AMAURA) LASTRA, new species.

Plate 28, fig. 7.

Shell thin, large, elongate-ovate, tapering very regularly to an acute point, narrowly umbilicated. Nuclear whorls very small, deeply obliquely immersed in the first of the succeeding whorls, above which only the tilted edge of the last volution projects. Post-nuclear whorls well rounded, moderately constricted at the sutures and narrowly shouldered at the summit, marked by numerous slender wavy spiral striations and fine lines of growth which give the surface a somewhat malleated appearance. Periphery and base of the last whorl strongly rounded, the latter narrowly umbilicated, marked like the spire. Aperture large, broadly oval, slightly effuse anteriorly; posterior angle acute; outer lip thin; columella slender, very oblique, almost straight and somewhat reflected; parietal wall glazed with a thin callus.

The type (Cat. no. 206928, U.S.N.M.) was dredged at U. S. Bureau of Fisheries station 2917, in 90 fathoms, temperature 49°.1, off southern California. It has eight post-nuclear whorls and measures: Length 13.6 mm., diameter 7 mm. Other specimens examined are as follows: One, Cat. no. 170794, U.S.N.M., from Santa Catalina Channel, California; one dredged by University of California at station 21 (3), off Santa Catalina Island, University of California coll.; one dredged by University of California at station 30, off Santa Catalina Island, University of California coll.; one dredged by University of California at station 81, off San Diego, University of California coll.

ODOSTOMIA (AMAURA) KENNERLEYI Dall and Bartsch.

Plate 28, fig. 8.

Odostomia (*Amaura*) *kennerleyi* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 529, pl. 48, figs. 8, 8*a*.

Shell large, very thin, broadly conic, umbilicated, yellowish-white; marked by subobsolete, subequal, and subequally spaced spiral wrinkles, about fifteen of which may be seen on the body and base of the last whorl. In addition to these wrinkles, many faint, closely placed spiral and vertical striae are present. Nuclear whorls small, about two and one-half, forming a depressed spire which is deeply immersed, the axis of which is almost at right angles to the axis of the latter whorls. Post-nuclear whorls very wide, inflated, well rounded, faintly shouldered at the summit. Suture well marked, simple. Periphery and base of the last whorl inflated, well rounded, the latter decidedly contracted and narrowly umbilicated. Aperture large, suboval, somewhat effuse anteriorly; posterior angle obtuse; outer lip thin; columella straight, obliquely inserted, revolute, not reënforced by the base, with an oblique weak fold near its insertion; parietal wall apparently without a callus.

The type (Cat. no. 150564, U.S.N.M.) was collected by Rev. G. W. Taylor at Nanaimo, British Columbia. It has six post-nuclear whorls which measure: Length 10.2 mm., diameter 6 mm.

Two other specimens (Cat. no. 4493*b*, U.S.N.M.) were collected by Doctor Kennerley at Puget Sound, Washington, and another (Cat. no. 129121) by Prof. O. B. Johnson, at Seattle, Washington.

ODOSTOMIA (AMAURA) ELSA, new species.

Plate 29, fig. 1.

Shell ovate, umbilicated, yellowish white. Nuclear whorls very small, deeply immersed in the first of the succeeding turns. Post-nuclear whorls well rounded, with strongly concave summits, forming deeply channeled sutures, marked by slightly retractive lines of growth, and exceedingly fine, closely placed, wavy spiral striations. Periphery of the last whorl well rounded. Base short, inflated, moderately umbilicated, marked like the spire. Aperture ovate, posterior angle obtuse; columella curved, slightly reflected, not reënforced by the base, provided with an oblique fold some little distance anterior to its insertion; parietal wall covered by a thin callus.

The type (Cat. no. 55811, U.S.N.M.) was collected by W. J. Fisher at Kadiak Island, Alaska. It has six post-nuclear whorls, and measures: Length 6.1 mm., diameter 3.6 mm.

ODOSTOMIA (AMAURA) BERINGI Dall.

Plate 27, fig. 8.

Odostomia beringi Dall, Am. Journ. Conch., vol. 7, 1872, p. 117.

Shell ovate, umbilicated, bluish white. Nuclear whorls small, obliquely immersed in the first of the succeeding turns. Post-nuclear whorls moderately rounded, slightly shouldered at the summits, marked by retractive lines of growth. Periphery of the last whorl well rounded. Base short, strongly umbilicated. Aperture oval; posterior angle obtuse, outer lip thin; columella strong, sinuous, decidedly reflected, provided with a strong fold a little below its insertion. Parietal wall glazed by a callus.

The type (Cat. no. 169456, U.S.N.M.) was collected by Doctor Dall at St. Michael, Norton Sound, Alaska. It has five post-nuclear whorls, and measures: Length 5.7 mm., diameter 2.8 mm.

ODOSTOMIA (AMAURA) SATURA Carpenter.

Plate 27, fig. 1.

Odostomia satura Carpenter, Ann. Mag. Nat. Hist., 3d ser., vol. 15, 1865, p. 29. +var. *pupiformis* Carpenter, Ann. Mag. Nat. Hist., 3d ser., vol. 15, 1865, p. 29. =*Odostomia* (*Amaura*) *satura* (Carpenter) Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 529–530, pl. 48, figs. 5, 5*a*.

Shell of medium size, broadly conic, white. Nuclear whorls at least two, forming a depressed spire, the axis of which is almost at a right angle to the axis of the later whorls, and which is deeply, somewhat obliquely immersed in the first post-nuclear turn. Post-nuclear whorls moderately well rounded, faintly shouldered at the summit, marked all over by irregular rough, low, tumescenses, which simulate obsolete vertical ribs. Sutures simple, well marked. Periphery of the last whorl well rounded. Base quite short, decidedly rounded, and umbilicated. Umbilicus partly covered by the revolute columella. Aperture large, very broadly oval, somewhat effuse anteriorly; posterior angle obtuse; outer lip thick; columella moderately strong, oblique, decidedly curved, with a decided oblique fold, situated considerably anterior to its insertion; parietal wall covered by a fairly thick callus.

The type (Cat. no. 15520, U.S.N.M.) was collected by J. G. Swan at Neah Bay, Washington. It has five and one-half whorls which measure: Length 6.4 mm., diameter 3.5 mm.

The specimen upon which Doctor Carpenter fixed the name *pupiformis* (Cat. no. 15520*a*, U.S.N.M.), collected by J. G. Swan at Neah Bay, Washington, is not worthy of a varietal name. It is a freak, having the spire less elevated, which is, perhaps, due to some injury received at an early date, evidence of which seems present. It agrees perfectly in every detail with the type of *satura* excepting the shape of the spire.

ODOSTOMIA (AMAURA) FARALLONENSIS, new species.

Plate 27, fig. 7.

Shell very elongate-ovate, deeply umbilicated, light yellow. Nuclear whorls very deeply immersed. Post-nuclear whorls very slightly rounded in the middle between the sutures, more strongly so near the anterior end and toward the summit. Summit strongly narrowly tabulate. Periphery of the last whorl inflated. Base very strongly suddenly rounded, widely and deeply umbilicated. Entire surface marked by numerous fine, closely spaced, spiral striations. Aperture broadly ovate, posterior angle obtuse, outer lip thin; columella very slender, strongly curved, revolute, provided with a deep fold a little below its insertion; parietal wall glazed with a thin callus.

The type (Cat. no. 168827 U.S.N.M.) was dredged by the U. S. Bureau of Fisheries station 3180, in 24 fathoms, temp. 50.°7, off the Farallones Islands, California. It has five post-nuclear whorls, and measures: Length 5.5 mm., diameter 2.7 mm.

ODOSTOMIA (AMAURA) SILLANA, new species.

Plate 28, fig. 9.

Shell short, conic, yellowish white. (Nuclear whorls eroded.) Post-nuclear whorls well rounded, slightly overhanging. Summits appressed, marked by almost vertical lines of growth and numerous closely spaced, wavy, microscopic, spiral striations. Suture well marked. Periphery of the last whorl well rounded. Base rather short, inflated, narrowly umbilicated and marked like the spire. Aperture broadly ovate, somewhat effuse anteriorly. Posterior angle acute; outer lip thin, strongly curved in the middle; columella slender, strongly curved and reflected anteriorly, provided with a weak fold near its insertion; parietal wall glazed by a thin callus.

The type (Cat. no. 168809, U.S.N.M.), collected by Doctor Dall west of Amaknak Island, Unalaska, in 60 fathoms, on stony bottom. It has five and one-half post-nuclear whorls, and measures: Length 5.6 mm., diameter 2.8 mm.

ODOSTOMIA (AMAURA) TALPA, new species.

Plate 27, fig. 9.

Shell stout, rough, very broadly conic, narrowly umbilicated. Nuclear whorls small, deeply obliquely immersed in the first post-nuclear turn. Post-nuclear whorls with quite strong concavely shouldered summits, the rest well rounded (usually showing decided erosion marks which coincide largely with the lines of growth). The parts bearing the original surface show traces of exceedingly fine spiral striations. Periphery and base of the last whorl rather inflated, well rounded, the latter narrowly umbilicated, marked like the spire. Aperture broadly oval, posterior angle obtuse; outer lip rather thick, columella stout, thick, somewhat flexuose and reflected, provided with a strong fold a little anterior to the umbilicus; parietal wall covered by a thin callus.

The type (Cat. no. 204027, U.S.N.M.) has seven post-nuclear whorls, and measures: Length 8 mm., diameter 3.8 mm. It and two other specimens were collected by Mrs. Kate Stephens at Mole Harbor, Alaska. Two additional specimens (Cat. no. 159472 U.S.N.M.) were dredged by Doctor Dall in 12 fathoms in Sitka Harbor, Alaska.

ODOSTOMIA (AMAURA) KRAUSEI Clessin.

Plate 29, fig. 5.

Odostomia krausei Clessin, Mart. Chem. Conch. Cab., 2d ed., Pyramid., 1900, p. 115, pl. 28, fig. 1. *Odostomia* (*Amaura*) *krausei* (Clessin) Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 30, 1906, p. 362, pl. 23, fig. 2.

Shell elongate-conic, thick and heavy, rough through erosion, yellowish white. (Nuclear whorls decollated in the type, judging from the pit in the apex they are probably deeply, obliquely immersed.) Post-nuclear whorls only moderately rounded, somewhat shouldered at the summit (surface decidedly eroded). Periphery and base of the last whorl well rounded, the latter with a minute umbilical chink. Aperture auricular, somewhat effuse anteriorly, posterior angle scarcely acute; outer lip very thick, reflexed, pillar with a broad, strong, oblique fold, a little anterior to its insertion; parietal wall covered by a thick callus.

The type has six post-nuclear whorls, and measures: Length 9.9 mm., diameter 5 mm. It was collected by Krause at Killisnoo, which is in Alaska, and not in Japan, as stated by Clessin. The registration number of his type in the Berlin Museum is also wrong; the specimen described and figured by him is Cat. no. 36335, and not Cat. no. 36336, as given in his account of the species.

The U. S. National Museum has two lots, one specimen (Cat. no. 159454, U.S.N.M.) from Killisnoo, collected by Krause, and another (Cat. no. 159471, U.S.N.M.) from Kadiak.

The last is in better state of preservation than the rest of the material examined; from it we learn that the whorls are strongly rounded, subtabulate at the summit and decidedly constricted at the sutures, marked by fine, slightly retractive lines of growth and exceedingly fine, closely spaced, microscopic spiral striations. Our figure is made from this specimen, which has seven post-nuclear whorls, which measure: Length 8.8 mm., diameter 4 mm.

ODOSTOMIA (AMAURA) ORCIA, new species.

Plate 27, fig. 3.

Shell elongate-ovate, narrowly umbilicated, yellowish-white. Nuclear whorls small, deeply immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls well rounded, moderately contracted at the sutures, and narrowly shouldered at the summit, marked by numerous closely spaced, wavy, spiral striations. Periphery and base of the last whorl inflated, well rounded, the latter narrowly umbilicated, both marked by spiral sculpture like that of the spire. Aperture moderately large, ovate, posterior angle obtuse; outer lip thin; columella strongly curved and somewhat reflected, provided with a strong fold a little posterior to its insertion; parietal wall covered with a thin callus.

The type (Cat. no. 206929, U.S.N.M.) comes from Santa Rosa Island. It has six post-nuclear whorls and measures: Length 7.7 mm., diameter 3.8 mm.

ODOSTOMIA (AMAURA) GOULDI Carpenter.

Plate 27, fig. 2.

Odostomia (*Amaura*) *gouldii* (Carpenter) Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 531, 532, pl. 48, fig. 4. *Odostomia* (? var.) *gouldii* Carpenter, Ann. Mag. Nat. Hist., 3d ser., vol. 15, 1865, p. 29.

Shell of medium size, elongate-conic, yellowish-white, the exterior surface marked by irregular tumescences, giving it a much worn appearance. Nuclear whorls three, deeply immersed, having their axis at about a right angle to the axis of the succeeding turns. Post-nuclear whorls moderately well rounded, faintly shouldered at the summit. Sutures simple, well marked. Periphery and base of the last whorl well rounded, the latter somewhat elongated. Umbilicus faint. Aperture quite large, pyriform, posterior angle obtuse, outer lip moderately thick; columella very oblique, fairly strong, revolute, with a strong fold somewhat anterior to its insertion; parietal wall covered with a fairly strong callus.

The type (Cat. no. 22821, U.S.N.M.) comes from Neah Bay, Washington. It has six post-nuclear whorls, and measures: Length 6.1 mm., diameter 3.1 mm.

ODOSTOMIA (AMAURA) ARCTICA, new species.

Plate 28, fig. 5.

Shell large, elongate-ovate, straw yellow. (Nuclear whorls decollated.) Post-nuclear turns well rounded, with subtabulate summits, marked by lines of growth and numerous fine, closely-placed, wavy, spiral striations. Periphery well rounded. Suture well impressed. Base rather elongated, marked like the space between the sutures. Aperture pear-shaped, rather narrow posteriorly, and somewhat effuse anteriorly, posterior angle rendered obtuse by the tabulation; outer lip thin; columella short, curved, slightly reflected, reënforced by the attenuated base and provided with a weak fold at its insertion; parietal wall covered by a thin translucent callus.

The type has lost the early whorls; the last four and one-half only remain, which measure: Length 12.4 mm., diameter 6.5 mm.

It and another specimen are entered as Cat. no. 168766, U.S.N.M., and were collected at U. S. Fish Commission station 3305, southwest of Hagemeister Island, Bering Sea, in 23 fathoms, at a bottom temperature of 41°.8. Another specimen (Cat. no. 109454, U.S.N.M.) comes from Sea Horse Islands, Arctic Ocean. Two lots (Cat. no. 168807, U.S.N.M.) four specimens collected in 15 fathoms off Icy Cape, Arctic Ocean, and a single specimen (Cat. no. 168808, U.S.N.M.), in 7 to 15 fathoms, from the same locality. Eight additional specimens were dredged at U. S. Fish Commission station 3306, off Bristol Bay, Bering Sea, in 33 fathoms, bottom temperature 38°.9.

ODOSTOMIA (AMAURA) AVELLANA Carpenter.

Plate 28, fig. 3.

Odostomia (? var.) *avellana* Carpenter, Ann. Mag. Nat. Hist., 3d ser., vol. 15, 1865, p. 30. *Odostomia* (*Amaura*) *nuciformis avellana* (Carpenter) Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, pp. 530, 531, pl. 48, figs. 1, 1*a*.

Shell large, elongate-ovate, yellowish to milk white. Nuclear whorls deeply vertically immersed; only part of the last volution is visible when viewed from above, their axis evidently being at a right angle to the axis of the later whorls. Post-nuclear whorls increasing rapidly in size, early ones well rounded, later ones less so, their summits being closely appressed to the preceding whorl. Suture well impressed, simple. Periphery and base of the last whorl well rounded, the latter somewhat elongated. Aperture large, ovate, somewhat effuse anteriorly, milk-white within; posterior angle acute; outer lip thin at the edge, thick within; columella short curved; reënforced partly by the attenuated base, having a strong oblique fold at its insertion; parietal wall covered by a moderately strong callus.

The type (Cat. no. 15517*b*, U.S.N.M.) comes from Neah Bay, Washington. It has five post-nuclear whorls and measures: Length 8.3 mm., diameter 4.3 mm.

ODOSTOMIA (AMAURA) MORATORA, new species.

Plate 30, fig. 7.

Shell elongate-ovate, imperforate, yellowish white. Nuclear whorls decollated. Post-nuclear whorls strongly rounded, moderately contracted at the sutures, narrowly flatly shouldered at the summit; marked by strong lines of growth and subobsolete fine spiral lirations which lend the surface a somewhat reticulated appearance. The spaces between the feeble lirations are marked by numerous very fine spiral striations. Periphery of the last whorl and base inflated, strongly rounded, marked like the spire. Aperture oval, posterior angle obtuse; outer lip thin; columella stout, oblique, revolute, provided with a strong fold a little below its insertion.

The type (Cat. no. 207261, U.S.N.M.) was dredged by the U. S. Bureau of Fisheries at station 3164, rocky bottom, temperature 48°.5, in 61 fathoms, off Point Reyes, California. It has six post-nuclear whorls and measures: Length 9.5 mm., diameter 4.9 mm.

ODOSTOMIA (AMAURA) PESA, new species.

Plate 29, fig. 2.

Shell elongate-ovate, very coarse and heavy. Nuclear whorls small, deeply, obliquely immersed in the first of the succeeding turns. Post-nuclear whorls rather high between the sutures, well rounded with narrowly tabulate summits, marked by somewhat retractive lines of growth and numerous, closely placed, wavy spiral striations. Sutures well marked. Periphery of the last whorl well rounded, marked like the spire. Base slightly prolonged, well rounded. Aperture ovate, somewhat effuse anteriorly; posterior angle acute; outer lip very heavy; columella strong, flexuose with a strong, broad fold somewhat anterior to its insertion; parietal wall covered by a thin callus.

The type (Cat. no. 157458, U.S.N.M.) was collected by Doctor Dall at Kadiak Island, Alaska. It has six post-nuclear whorls, and measures: Length 9.3 mm., diameter 4.4 mm.

ODOSTOMIA (AMAURA) NOTA, new species.

Plate 28, fig. 6.

Shell very elongate-ovate, light yellow. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls moderately rounded, slightly contracted at the sutures, narrowly tabulately shouldered at the summits, marked by numerous closely spaced, wavy spiral striations. Periphery and base of the last whorl somewhat inflated, well rounded, marked like the spire. Aperture ovate, posterior angle obtuse; outer lip thin; columella short, strongly curved, reflected and provided with a moderately strong fold a little anterior to its insertion.

The type (Cat. no. 46490, U.S.N.M.) and sixteen specimens comes from San Diego, California. The type has seven post-nuclear whorls and measures: Length 7.5 mm., diameter 3.5 mm.

The following specimens have been examined:

U.S.N.M. cat. no.	Number of specimens.	U. S. B. F. station.	Locality.	Depth, fathoms.	Temperature, degrees.	Disposition of material.
206930	9	2901	Off Santa Rosa Island, California.	48	55.1	U. S. Nat. Mus.
168804	4		San Pedro, California			Do.
	3		do			Oldroyd coll.
	1		do			Berry coll.
	8	[a] 20	Off Newport, California			Univ. Cal. coll.
	5	[a] 32	Off Catalina Island, California.			Do.
	5	[a] 34	do			Do.
	3	[a] 36	do			Do.
	2		Pacific Beach, California			Kelsey coll.
	3	[a] 47	San Diego, California			Univ. Cal. coll.
46490	17		do			U.S. Nat. Mus.

[a] University of California station.

ODOSTOMIA (AMAURA) ILIULIUKENSIS, new species.

Plate 29, fig. 4.

Shell very elongate-conic, heavy, very light yellow. Nuclear whorls small, almost completely obliquely immersed in the first of the succeeding turns. Post-nuclear whorls rather high between the sutures, well rounded with narrowly tabulate summits, marked by fine, retractive lines of growth and numerous fine, closely spaced spiral striations. Suture well marked. Periphery of the last whorl well rounded. Base rather prolonged, evenly rounded, marked like the spire. Aperture pear-shaped, posterior angle obtuse; outer lip thin at the edge, thickened within; columella twisted, strongly curved anteriorly, where it is also reflected and reënforced by the base, provided with a low fold at its insertion; parietal wall glazed by a thin callus.

The type (Cat. no. 159463, U.S.N.M.) was collected by Doctor Dall in 6 fathoms, on mud bottom, off Iliuliuk Village, Captains Bay, Unalaska, Alaska. It has six and one-half post-nuclear whorls, and measures: Length 9.5 mm., diameter 4.6 mm. Ten additional specimens (Cat. no. 159453, U.S.N.M.) were collected by Doctor Dall, at Eider Cove, Captains Bay, Unalaska, in 25 fathoms on sand bottom. Another specimen (Cat. no. 159465, U.S.N.M.), likewise collected by Doctor Dall, bears the legend Unalaska, without specific locality.

ODOSTOMIA (AMAURA) NUCIFORMIS Carpenter.

Plate 28, fig. 1.

Odostomia nuciformis Carpenter, Ann. Mag. Nat. Hist., 3d ser., vol. 15, 1865, p. 30. *Odostomia* (*Amaura*) *nuciformis* (Carpenter). Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 530, pl. 48, figs. 3, 3*a*.

Shell large, shortly ovate, yellowish to milk-white. Nuclear whorls deeply immersed; only half of the last turn is seen in tilted position when viewed from above. Post-nuclear whorls increasing rapidly in size, well rounded, having their summits closely appressed to the preceding whorl. Suture moderately well impressed. Periphery and base of the last whorl well rounded. Aperture rather large, ovate, white within; posterior angle acute; outer lip moderately thin at the edge, thicker within; columella short, strongly curved, with a strong oblique fold at its insertion; reënforced by the attenuated base; parietal wall covered by a thin callus.

The type (Cat. no. 15517*a*, U.S.N.M.) comes from Neah Bay, Washington. It has five post-nuclear whorls which measure: Length 7.7 mm., diameter 4.4 mm.

ODOSTOMIA (AMAURA) CANFIELDI Dall.

Plate 28, fig. 2.

Odostomia (*Amaura*) *canfieldi* Dall, Nautilus, vol. 31, 1908, p. 131. =*Odostomia* (*Amaura*) *montereyensis* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 531, pl. 48, figs. 6, 6*a*; not *Odostomia* (*Chrysallida*) *montereyensis* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 33, 1907, p. 516, pl.46, fig. 4.

Shell large, similar in form to *O.* (*A.*) *avellana;* white, shining. Nuclear whorls 3, helicoid, quite elevated, deeply immersed in the first of the succeeding whorls, having their axis at a right angle to the axis of the later whorls. Post-nuclear whorls well rounded, with a beveled shoulder at the summits. Suture well marked, simple. Periphery and base of the last whorl well rounded and inflated, the latter somewhat elongated. Aperture subovate, somewhat effuse anteriorly; posterior angle acute; outer lip thin at the edge, thick within; columella curved and somewhat revolute, having a prominent oblique fold near its insertion; parietal wall covered by a thin callus.

The type (Cat. no. 46473, U.S.N.M.) is from Monterey, California. It has six post-nuclear whorls which measure: Length 9.6 mm., diameter 5.1 mm.

In addition to these, others have been named for the University of California from Monterey; for Mr. S. S. Berry from 12 fathoms off Del Monte, Monterey Bay; for Mrs. Oldroyd from San Pedro, and for Mr. Kelsey from San Diego, California.

This species resembles *O.* (*A.*) *avellana* Carpenter, but differs markedly from that form by having the summits of the whorls shouldered.

ODOSTOMIA (AMAURA) SUBTURRITA, new species.

Plate 28, fig. 4.

Shell ovate, light yellow. Nuclear whorls small, deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls flattened, scarcely at all contracted at the sutures, with a very broad tabulate summit, crossed by numerous spiral striations, which are a little darker colored than the general surface of the shell. Periphery and base of the last whorl somewhat inflated, well rounded, marked like the space between the sutures. Aperture large, oblong-ovate, slightly effuse anteriorly; posterior angle very obtuse; outer lip thick within, thin at the edge; columella curved, somewhat twisted, strongly reflected, provided with a strong fold a little anterior to its insertion.

The type (Cat. no. 168801, U.S.N.M.) and nine specimens come from San Pedro, California. The type has six post-nuclear whorls and measures: Length 6.9 mm., diameter 3.5 mm.

The following additional specimens have been examined:

U.S.N.M. cat. no.	No. of specimens.	U.S.B.F. station.	Locality.	Depth, fathoms.	Disposition of material.
	2		Santa Barbara, California		Univ. Cal. coll.
206931	1	2901	Off Santa Rosa Island, California	48	U. S. Nat. Mus.
	1	[a]12	Redondo, California		Univ. Cal. coll.
	8		San Pedro, California		Oldroyd coll.
206932	5		do		U. S. Nat. Mus.
105535	3		San Diego, California		Do.
206933	2		San Diego (Pacific Beach), California.		Do.
46472	1		Todos Santos Bay, Lower California.		Do.

[a] University of California.

ODOSTOMIA (AMAURA) MARTENSI Dall and Bartsch.

Plate 29, fig. 3.

Odostomia (*Amaura*) *martensi* Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 30, 1906, p. 361, pl. 15, fig. 5. *Odostomia curta* Clessin, Mart. Chem. Conch. Cab., 1900, p. 116, pl. 28, fig. 3; not *Odostomia curtum* Deshayes, An. Sans. Vert. Paris Basin, 1862, p. 551, pl. 19, figs. 9-11.

Shell ovoid, heavy, yellowish white. Nuclear whorls small, almost completely immersed in the first of the succeeding volutions. Post-nuclear whorls increasing regularly and rapidly in size, inflated, subtabulately shouldered at the summit, marked by numerous fine lines of growth and equally abundant, closely placed, wavy spiral striations. These lines of growth and spiral markings give the surface a finely reticulated appearance when viewed under high magnifications. (We have omitted this sculpture in our drawing, which should be considered as an outline sketch only.) Periphery and base of the last whorl decidedly rounded and inflated, marked like the space between the sutures. Aperture large, suboval, slightly effuse anteriorly, posterior angle acute; outer lip sharp at the edge but thick within; columella very strong, curved, reënforced by the body whorl, from which the slightly reflected edge is separated only by a narrow line. A strong oblique fold, not completely visible when the aperture is viewed squarely, is located a little anterior to the insertion of the columella.

The type has five post-nuclear whorls and measures: Length 5.3 mm., diameter 3.1 mm. Clessin gives the diameter as 1.3, evidently a transposition. He also cites the registration number as 36336, while it should be 36335. His figure almost represents this species. The type comes from Killisnoo, Alaska, not Japan, as cited by Clessin.

Subgenus SCALENOSTOMA Deshayes.

Scalenostoma Deshayes, Cat. Moll. Ile de la Réunion, 1863, pp. 58-60.

Smooth Odostomias having a strong peripheral keel.

Type.—Scalenostoma carinatum Deshayes.

KEY TO THE SPECIES OF THE SUBGENUS SCALENOSTOMA.

Aperture irregularly ovate	*rangii.*
Aperture regularly broadly ovate	*dotella.*

ODOSTOMIA (SCALENOSTOMA) DOTELLA, new species.

Plate 30, fig. 5.

Shell elongate-conic, vitreous, translucent. Nuclear whorls deeply obliquely immersed in the first of the succeeding turns, above which only the tilted edge of the last volution projects. Post-nuclear whorls flattened, very strongly angulated at the periphery where they are much wider than at the appressed summit. The summit of the succeeding turns falls very much anterior to the angulated periphery and gives to the whorls a decided overhanging appearance. Base well rounded. Entire surface of spire and base marked by numerous, almost vertical lines of growth and very many exceedingly fine spiral striations. Aperture broadly ovate, posterior angle acute; outer lip thin; angulated at the periphery; columella slender, very strongly curved and slightly revolute.

The type (Cat. no. 206934, U.S.N.M.) and six specimens were dredged at U. S. Bureau of Fisheries stations 2826–2828, in 9½ to 10 fathoms, off Ceralvo Island, Gulf of California. The type has six post-nuclear whorls and measures: Length 2.3 mm., diameter 0.8 mm. Cat. no. 206935, U.S.N.M., contains six specimens from U. S. Bureau of Fisheries station 2823, off La Paz, in 26½ fathoms, broken shell bottom, off Cacachitas, Gulf of California. These and the next are provisionally referred here. One specimen from U. S. Bureau of Fisheries station 2822, in 21 fathoms, off La Paz, Mexico (Cat. no. 206936, U.S.N.M.).

ODOSTOMIA (SCALENOSTOMA) RANGII de Folin.

Plate 30, fig. 2.

Chemnitzia rangii DE FOLIN, Les Méléagrinicoles, 1867, p. 61, pl. 6, fig. 1.

Shell elongated-turrited, white. Nuclear whorls small. Post-nuclear whorls flat in the middle, somewhat excurved at the summit which is closely appressed against the preceding whorl immediately anterior to the keel. Periphery of the last whorl marked by a very strong acute lamellar keel. Base moderately well rounded. Aperture irregularly ovate, posterior angle acute; outer lip thin, strongly angulated at the periphery; columella curved and reflected; parietal wall covered with a thin callus.

De Folin's type comes from the Bay of Panama or Negritos Island. It has twelve post-nuclear whorls and measures: Length 2.7 mm., diameter 1.1 mm.

Subgenus **HEIDA** Dall and Bartsch.

Heida Dall and Bartsch, Proc. Biol. Soc. Wash., vol. 17, 1904, p. 13.

Shell without axial or spiral sculpture beyond mere lines of growth and exceedingly fine spiral striations; peritreme continuous, aperture rissoid.

Type.—Syrnola caloosaensis Dall.

ODOSTOMIA (HEIDA) PANAMENSIS Clessin.

Plate 30, fig. 6.

Odostomia panamensis Clessin, Mart. Chem. Conch. Cab., 2d ed., Pyramidellidæ, 1900, p. 120, pl. 28, fig. 9. *Odostomia* (*Heida*) *panamensis* (Clessin) Dall and Bartsch, Proc. U. S. Nat. Mus., vol. 30, 1906, pp. 365, 366, pl. 26, fig. 4.

Shell small, heavy, elongate-ovate, whorls increasing regularly in size, milk white, shining. Nuclear whorls small, almost completely obliquely immersed in the first of the succeeding volutions. Post-nuclear whorls moderately and evenly rounded, of porcellanous texture, without any apparent marking, separated by a well marked suture. Periphery of the last whorl full and rounded. Base inflated, well rounded. Aperture small, decidedly rissoid, almost channeled anteriorly, posterior angle acute; outer lip decidedly curved backward anteriorly, very thick within but beveled to form a sharp edge; columella extremely short, somewhat reflected, and connected posteriorly with the very strong parietal callus, which is fully as thick as the edge of the outer lip and connects with it at the posterior angle of the aperture, thus forming a complete peristome. A prominent oblique fold is present on and a little anterior to the insertion of the columella.

There are two specimens of this species in the Berlin collection from Panama. We have considered the best preserved individual, which evidently served Clessin for his description and figure as his type, and have here rediagnosed and figured it. It has six post-nuclear whorls and measures: Length 3.1 mm., diameter 1.5 mm.

Clessin for some unaccountable reason changed the characters of the aperture in the above-cited figure to harmonize with the typical *Odostomia* aperture. He seems to have failed entirely in recognizing the peculiarities of the present species.

O. (*Heida*) *panamensis* Clessin, represents the first member of this subgenus on the west coast of America; several additional species inhabit the southeast coast.

Subgenus **ODOSTOMIA** s. s.

Odostomia Fleming, Edinburgh Encyc., vol. 7, pt. 1, 1817, p. 76. =*Odontostomia* Jeffreys, Mal. and Conch. Mag., 1839, p. 34, same type. =*Turritostomia* Sacco, I Moll. del Piemonte e della Liguria, 1892, p. 41, same type.

Shell without axial or spiral sculpture excepting microscopic lines of growth.

Type.—*Turbo plicatus* Montagu.

KEY TO THE SPECIES OF THE SUBGENUS ODOSTOMIA.

Periphery of the last whorl angulated.
  Whorls overhanging .... *farella*, p. 232.
  Whorls not overhanging.
    Whorls well rounded .... *dinella*, p. 232.
    Whorls flattened .... *mammillata*, p. 233.
Periphery of the last whorl well rounded .... *coronadoensis*, p. 233.

ODOSTOMIA (ODOSTOMIA) FARELLA, new species.

Plate 30, fig. 4.

Shell small, white. (Nuclear whorls decollated.) Post-nuclear whorls flattened in the middle, slightly rounded at the appressed summit, strongly contracted at the suture, where they are decidedly overhanging. Suture well impressed. Periphery angulated. Base well rounded, narrowly umbilicated. Entire surface of spire and base marked by fine lines of growth only. Aperture ovate, posterior angle acute; outer lip thin; columella very oblique posteriorly, decidedly curved anteriorly, strongly reflected, provided with a weak fold somewhat anterior to its insertion; parietal wall covered with a thin callus.

The type (Cat. no. 206937, U.S.N.M.) was dredged off Long Beach, California. It has five post-nuclear whorls and measures: Length 2.5 mm., diameter 1.2 mm.

ODOSTOMIA (ODOSTOMIA) DINELLA, new species.

Plate 30, fig. 1.

Shell small, ovate, vitreous, semitransparent. (Nuclear whorls decollated.) Post-nuclear whorls forming a spire with almost straight sides, slightly rounded, feebly contracted at the suture, appressed at the summit, marked only by lines of growth. Suture well impressed. Periphery of the last whorl obscurely angulated. Base somewhat inflated, well rounded, narrowly umbilicated, marked like the spire. Aperture ovate, posterior angle acute; outer lip thin; columella slender, almost vertical, slightly revolute, provided with a weak fold at its insertion; parietal wall covered with a strong callus.

The type (Cat. no. 206938, U.S.N.M.) was dredged near Redondo, California. It has five post-nuclear whorls and measures: Length 2.2 mm., diameter 1.2 mm.

ODOSTOMIA (ODOSTOMIA) CORONADOENSIS, new species.

Plate 30, fig. 3.

Shell minute, ovate, vitreous. Nuclear whorls almost vertically deeply immersed in the first of the succeeding turns, above which the tilted edge of the last volution projects. Post-nuclear whorls well rounded, slightly contracted at the sutures, with a well rounded shoulder at the summit, marked by retractive lines of growth only. Suture well impressed. Periphery and base of the last whorl slightly inflated, well rounded, marked like the spire. Aperture ovate; posterior angle acute; outer lip thin; columella slender, strongly curved, slightly revolute, reënforced by the base, provided with a weak, deep-seated fold; parietal wall covered with a thin callus.

The type (Cat. no. 206939, U.S.N.M.) was dredged by Mr. F. W. Kelsey in 35 fathoms, off Coronado Beach, San Diego, California. It has four post-nuclear whorls and measures: Length 1.7 mm., diameter 0.8 mm. Two topotypes are in Mr. Kelsey's collection.

ODOSTOMIA (ODOSTOMIA) MAMMILLATA Carpenter.

Plate 30, fig. 8.

Odostomia mammillata Carpenter, Cat. Mazatlan Shells, 1856, p. 412.

Shell ovate, milk-white. Nuclear whorls large, oblique, two-thirds immersed in the first of the succeeding turns. Post-nuclear whorls decidedly flattened, rather high between the sutures, smooth. Suture well impressed. Periphery marked by a slender, raised cord, which renders it angulated. Base rather short, slightly inflated immediately below the umbilical area. Aperture broadly oval; posterior angle acute; outer lip thin, angulated at the periphery; columella short, slender, strongly curved and slightly reflected; parietal wall covered by a strong callus.

A single specimen of this species is known. It is on tablet 1957, Liverpool collection, British Museum, and was taken off *Chama* at Mazatlan, Mexico. It has four post-nuclear whorls and measures: Length 1.1 mm., diameter 0.7 mm.

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Copy of a camera lucida sketch by Dr. Carpenter.

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Copy of a camera lucida sketch by Dr. Carpenter.
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Copy of a camera lucida sketch by Dr. Carpenter.
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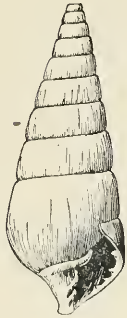
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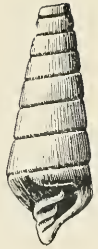
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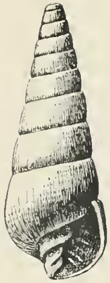
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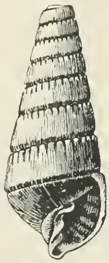
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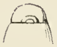
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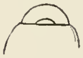
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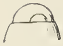
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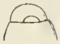
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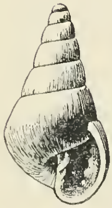
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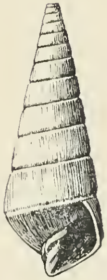
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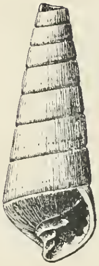
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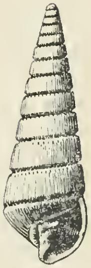
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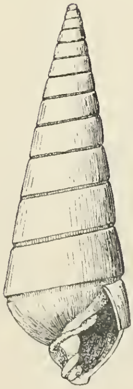
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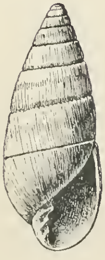
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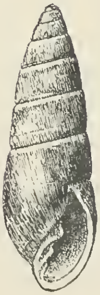
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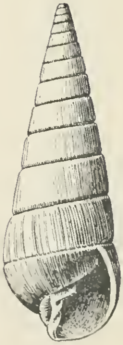
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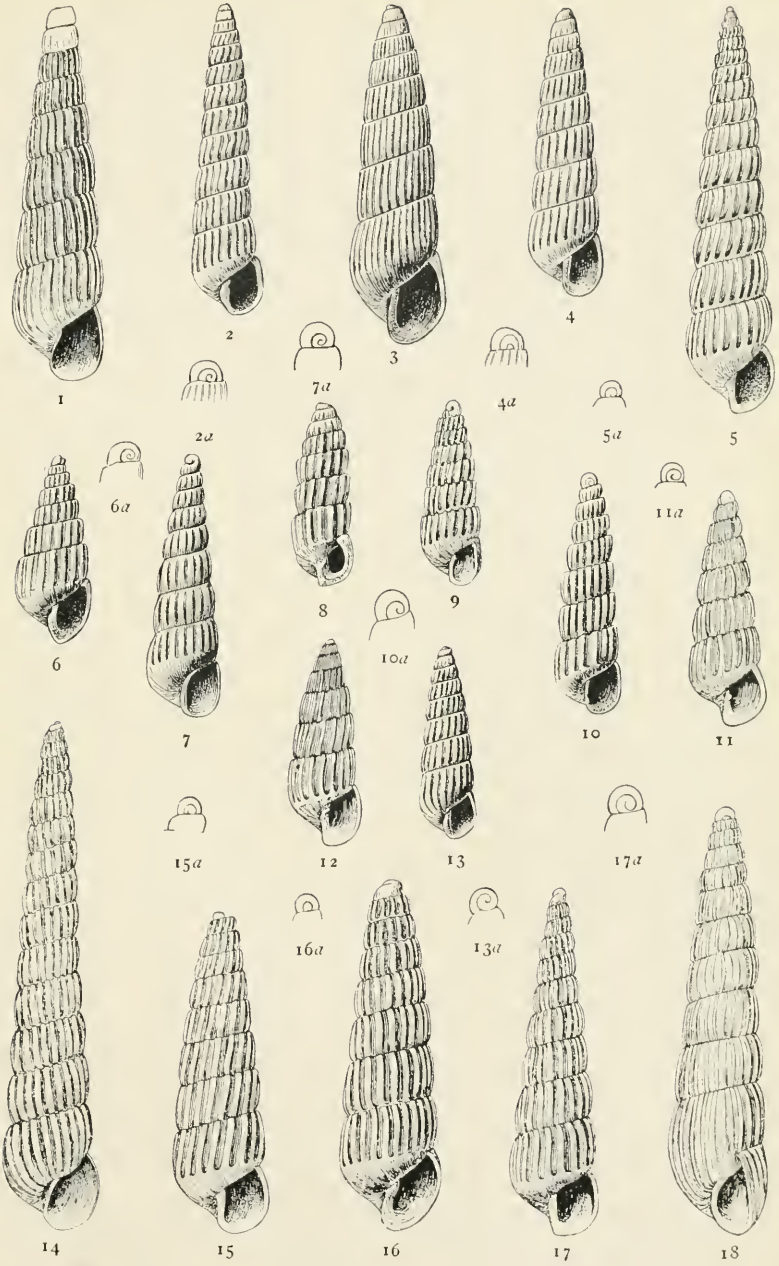
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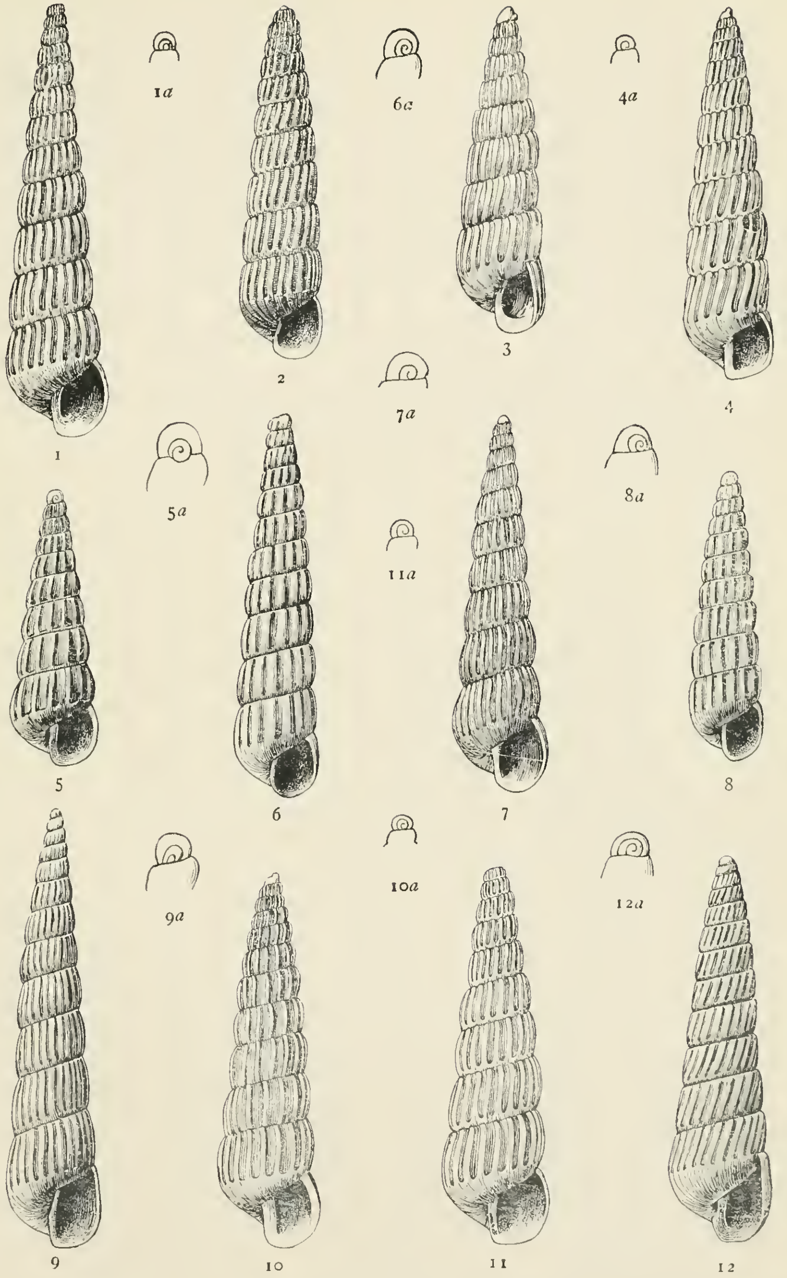
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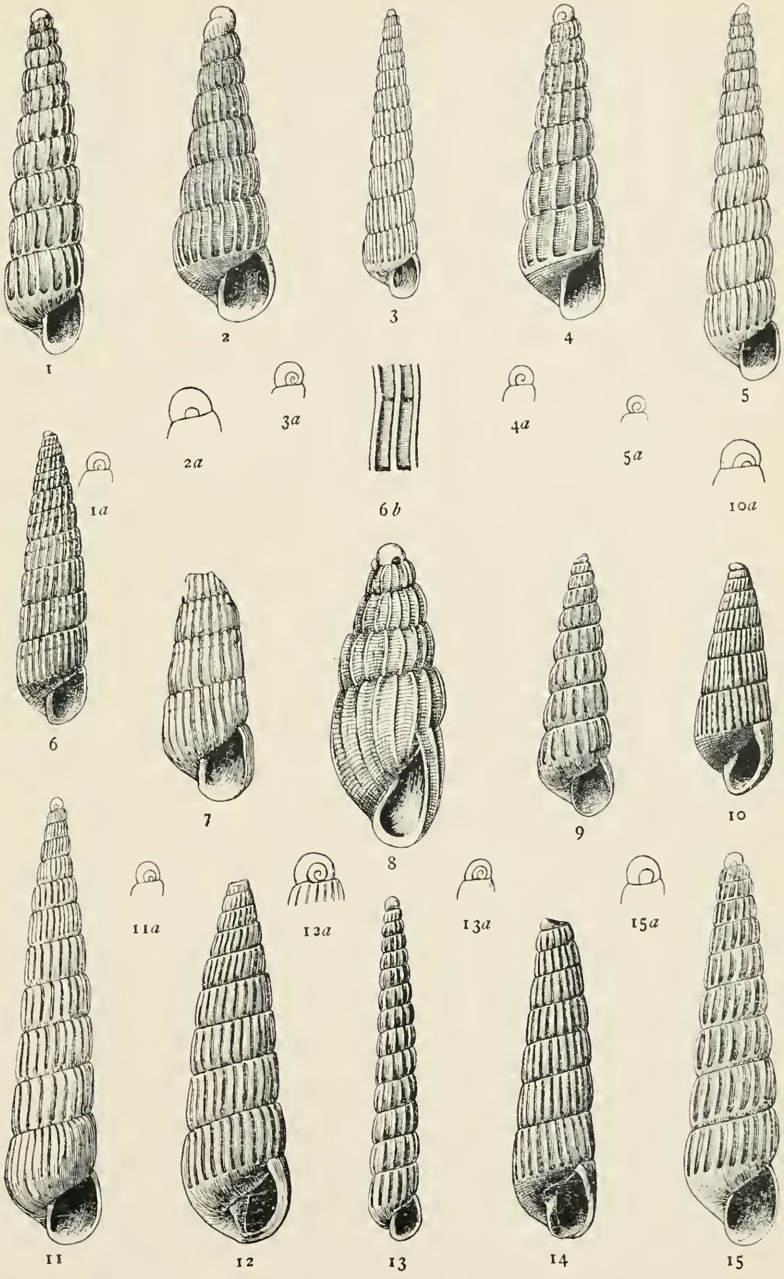
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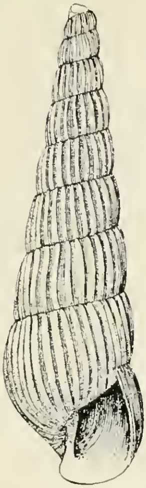
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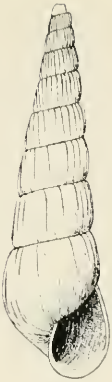
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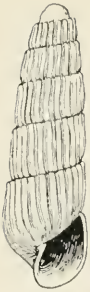
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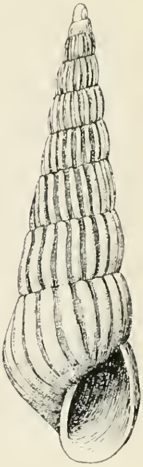
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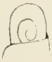
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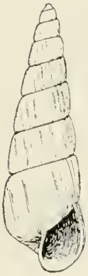
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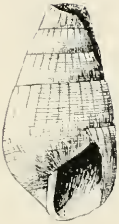
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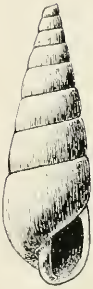
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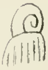
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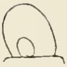
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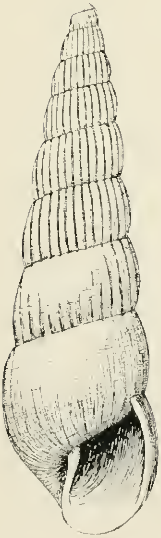
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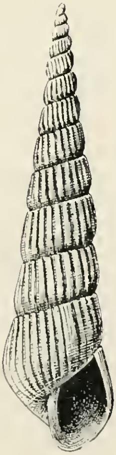
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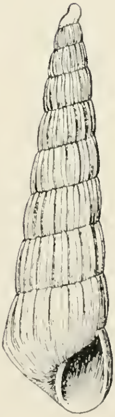
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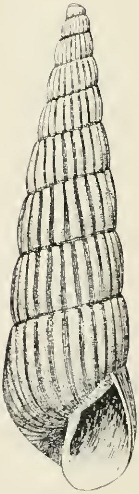
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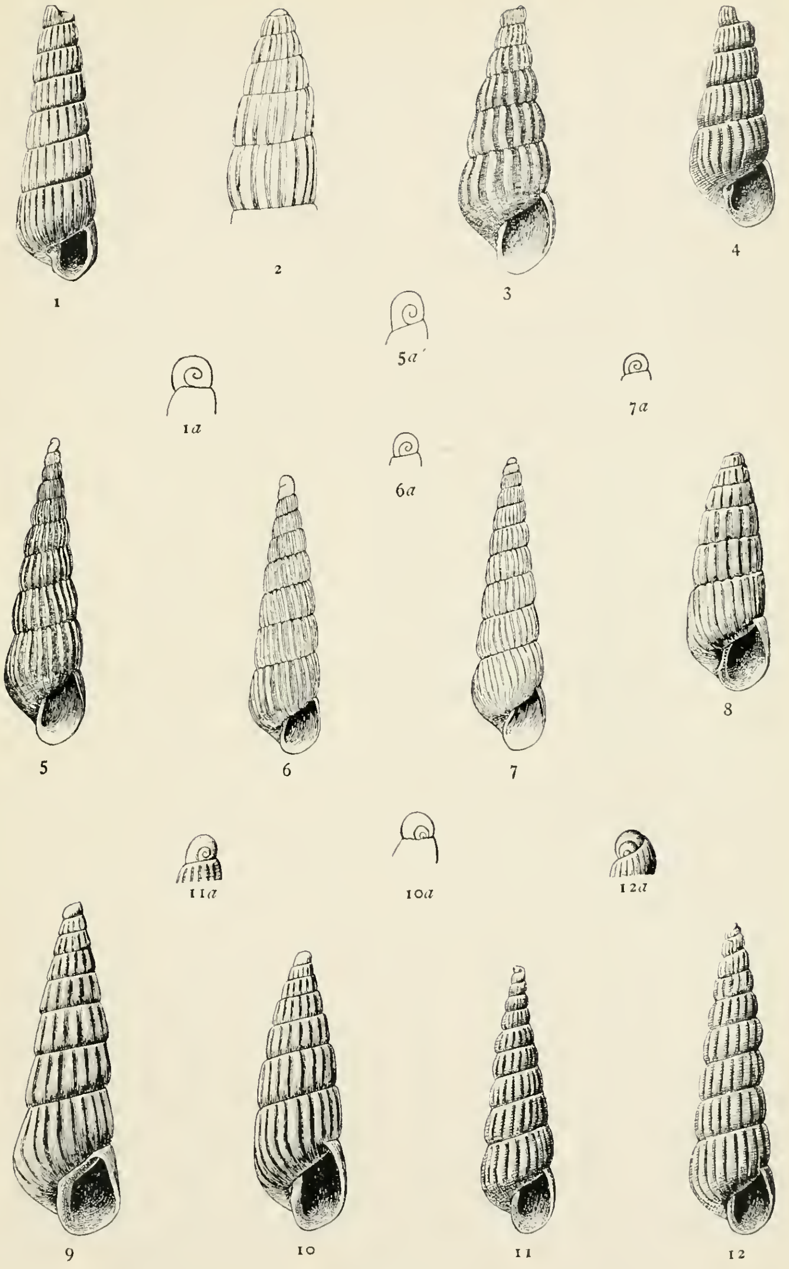
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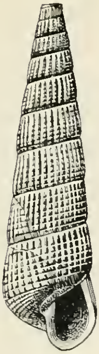
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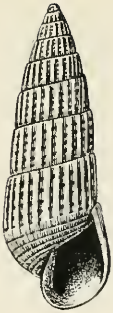
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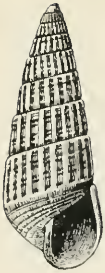
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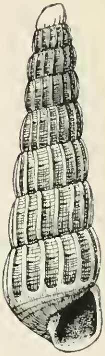
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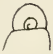
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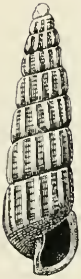
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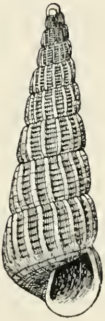
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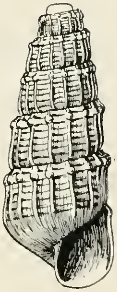
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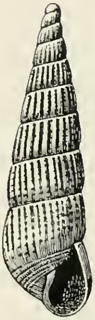
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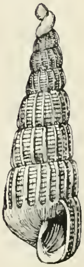
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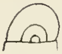
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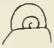
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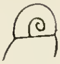
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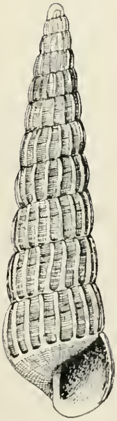
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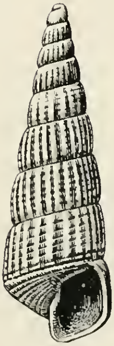
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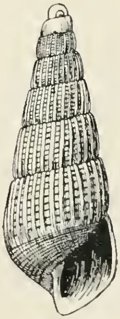
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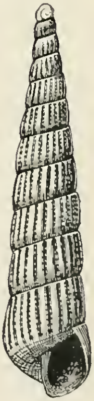
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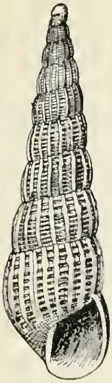

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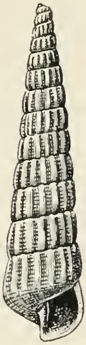

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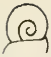

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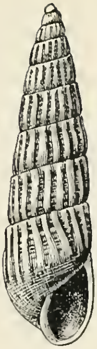

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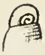

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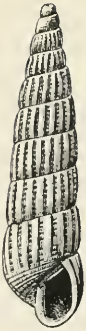

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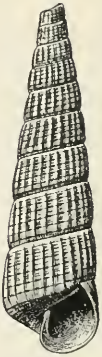

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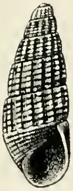

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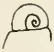

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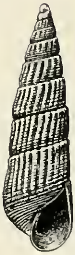

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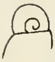

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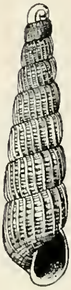

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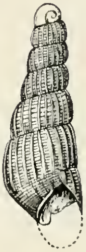

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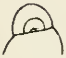

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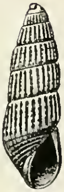

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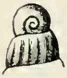

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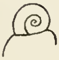

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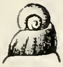

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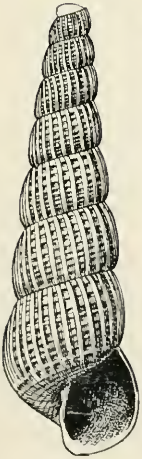

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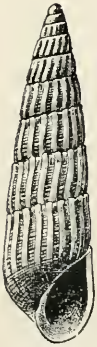

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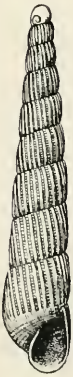

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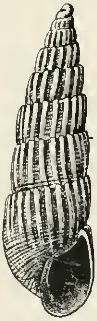

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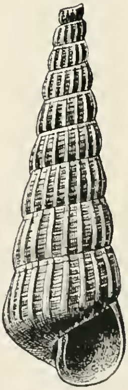

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1. nereia, p. 86
2. nuttalli, p. 90
3. tenuicula var., p. 92
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5. antestriata, p. 87
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12. t. crebrifilata, p. 93
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14. t. subcuspidata, p. 93
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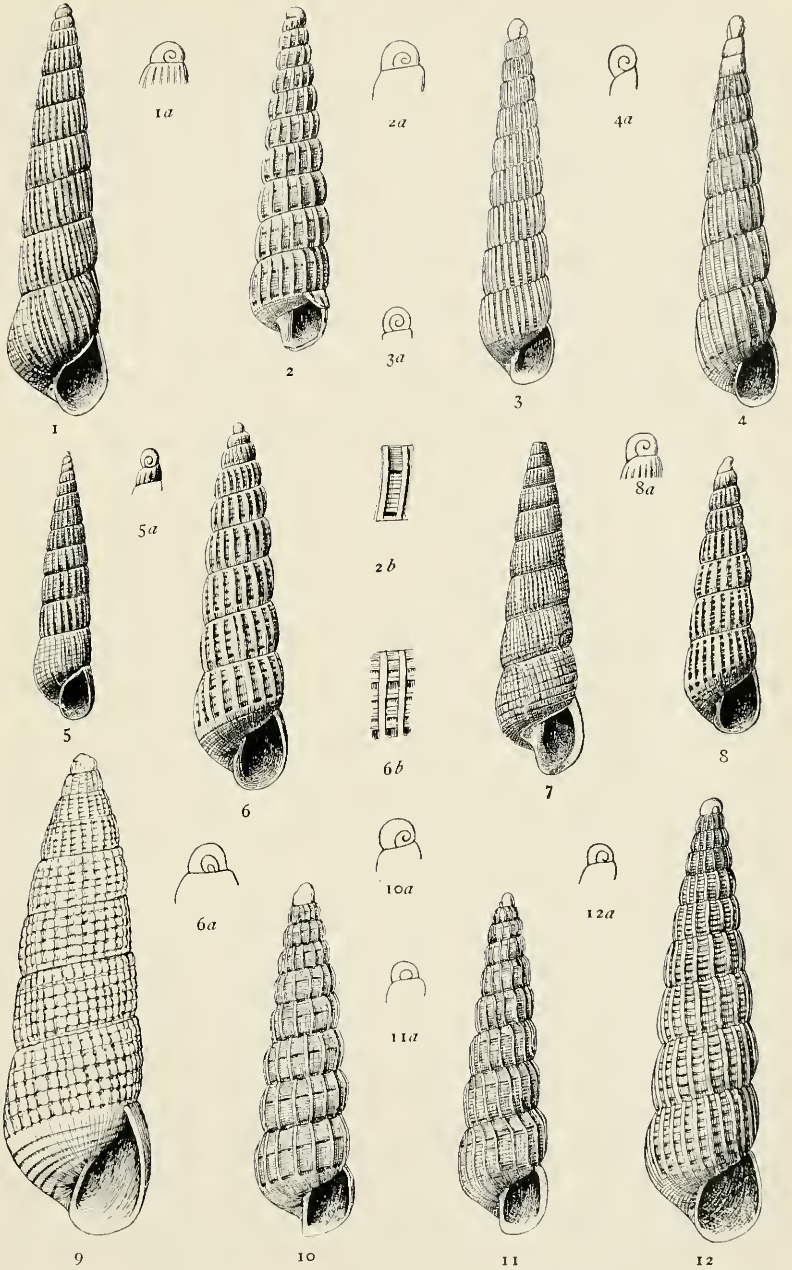
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1. castanea, p. 101
2. sanctorum, p. 98
3. canfieldi, p. 95
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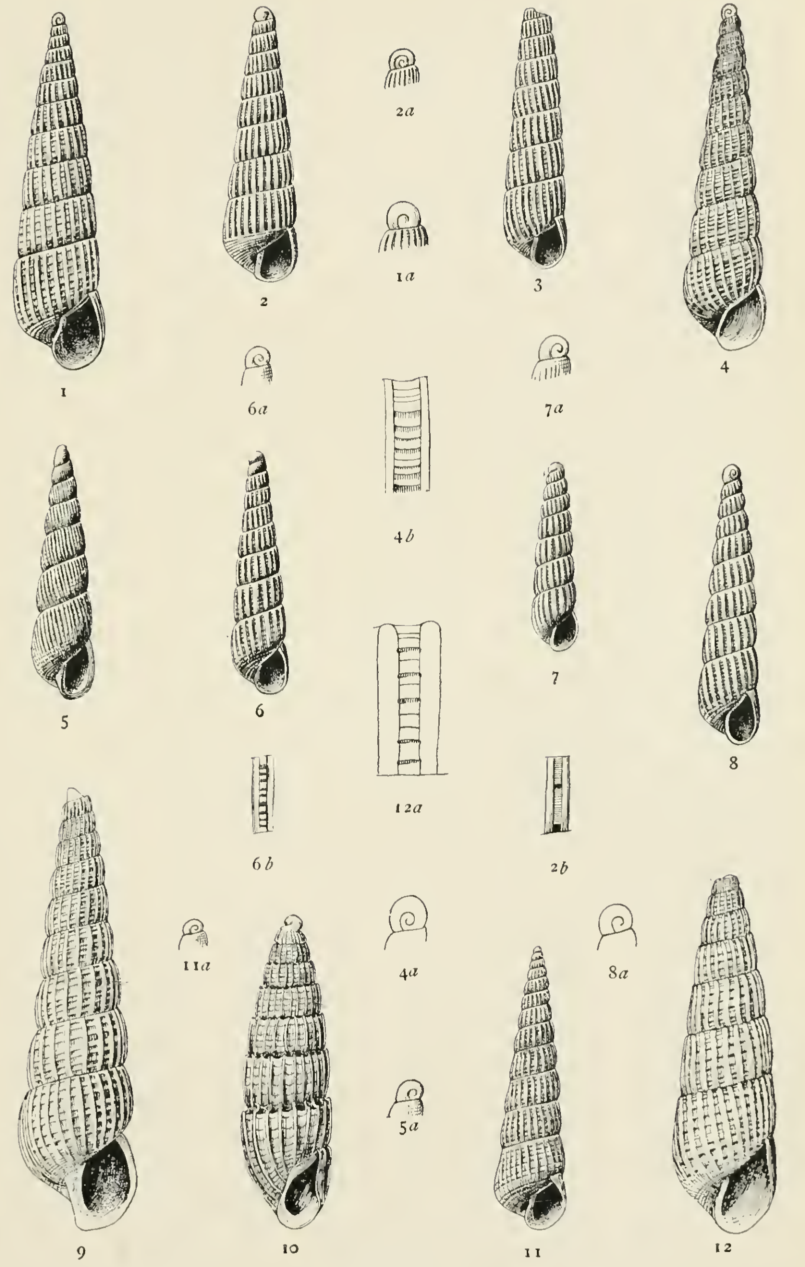
12. aragoni, p. 85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5a
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TURBONILLA

1. craticulata, p. 104
2. cinctella, p. 108
3. subula, p. 106
4. larunda, p. 109
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8. histias, p. 105
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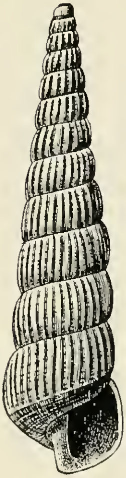
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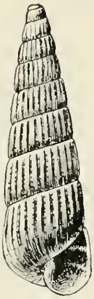
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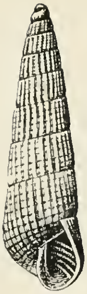
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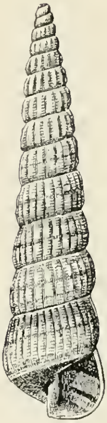
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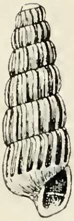
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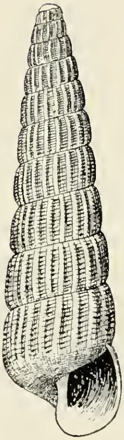
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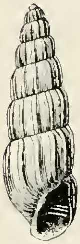
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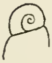
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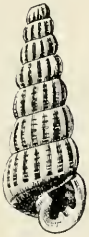
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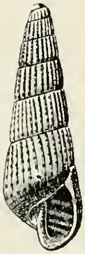
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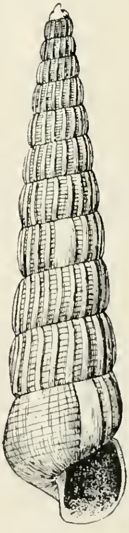
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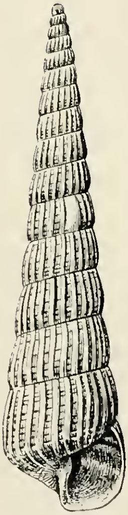
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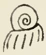
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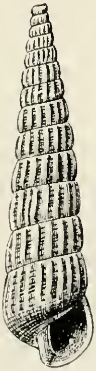
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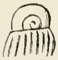
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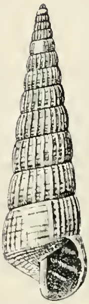
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6a

TURBONILLA

1. regina, p. 112
2. ignacia, p. 119
3. pentalopha, p. 117
4. lordi, p. 111
5. phalera, p 120
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9. heterolopha, p. 118
10. catalinensis, p. 113
11. major, p. 116
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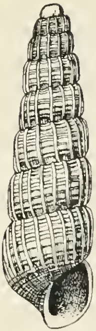
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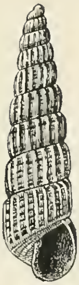
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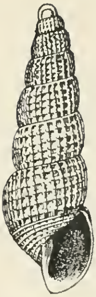
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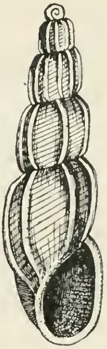
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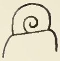
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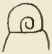
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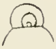
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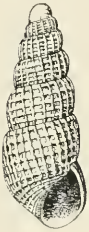
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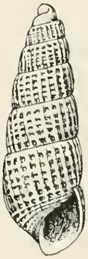
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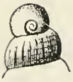
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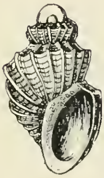
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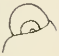
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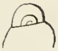
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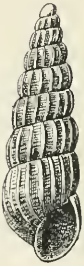
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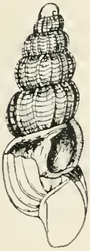
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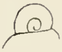
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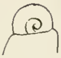
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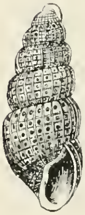
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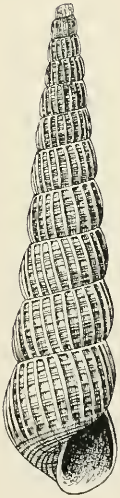
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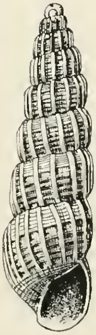
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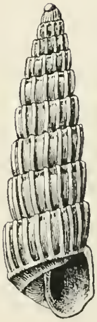
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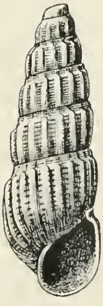
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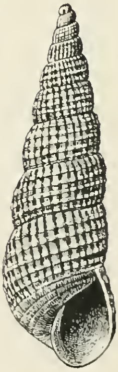
16

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3. sedillina, p. 121
4. excolpa, p. 123
5. festiva, p. 127
6. cancellata, p. 127
7. andrewsi, p. 124
8. hipolitensis, p. 123
9. swani, p. 129
10. paucilirata, p. 129
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12. arata, p. 125
13. eucosmia, p. 128
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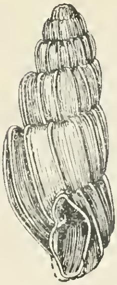
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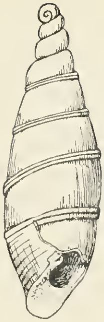
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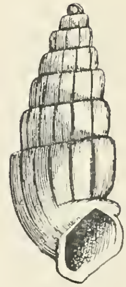
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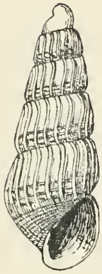
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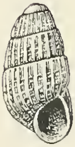
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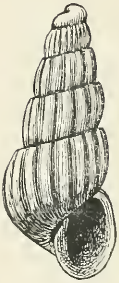
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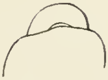
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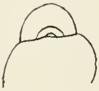
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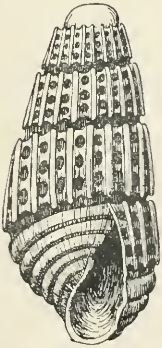
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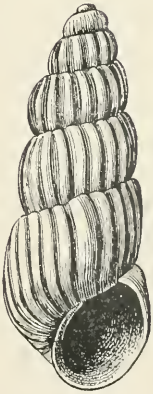
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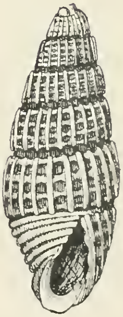
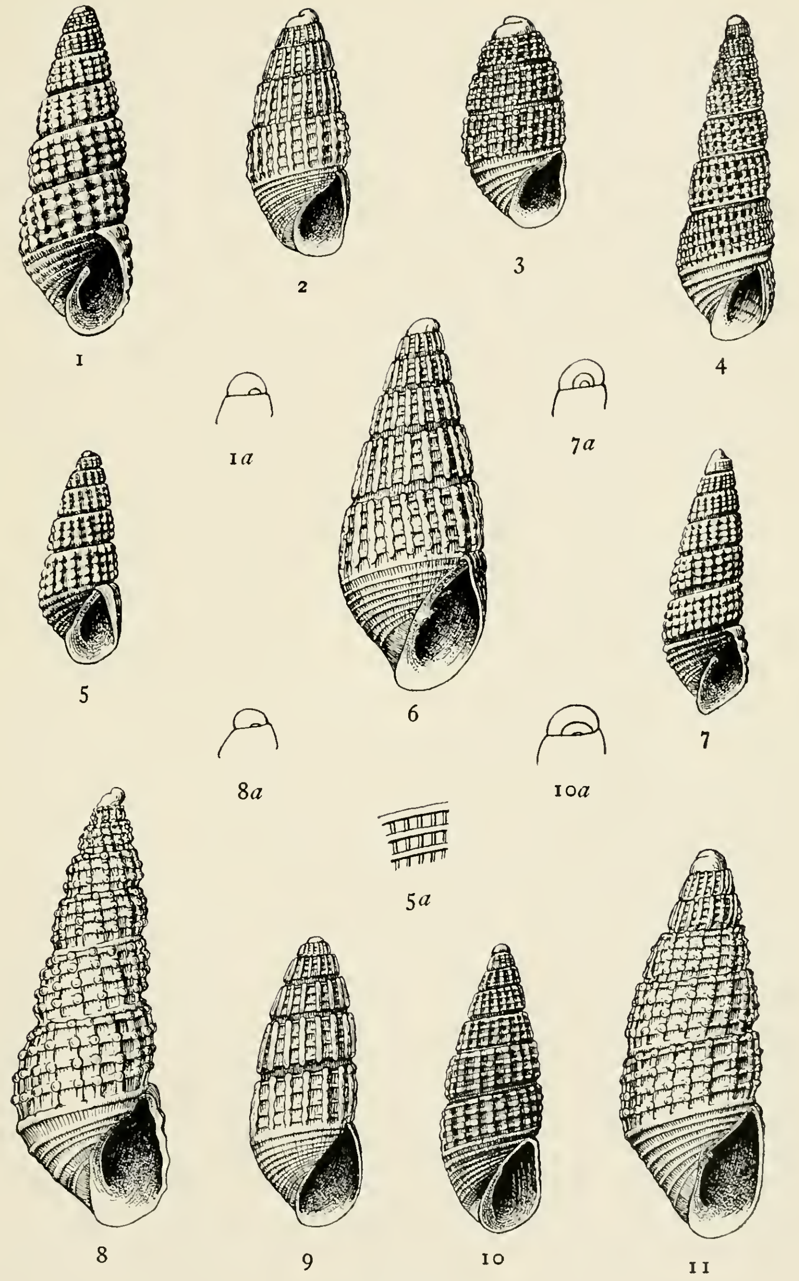

9

ODOSTOMIA

1. scalariformis, p. 135
2. clausiliformis, p. 132
3. tropidita, p. 134
4. convexa, p. 135
5. callimorpha, p. 136
6. richi, p. 133
7. reigeni, p. 138
8. laxa, p. 133
9. telescopium, p. 139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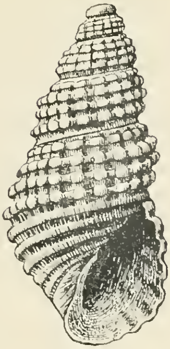
11

ODOSTOMIA

1. eugena, p. 147
2. torrita, p. 142
3. inconspicua, p. 139
4. paupercula, p. 144
5. effusa, p. 144
6. acrybia, p. 141
7. clathratula, p. 145
8. ritteri, p. 146
9. licina, p. 143
10. communis, p. 141
11. excelsa, p. 140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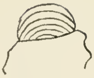
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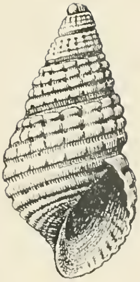
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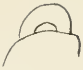
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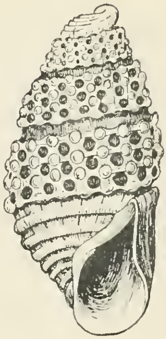
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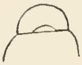
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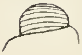
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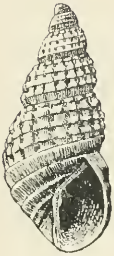
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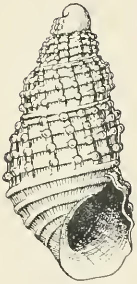
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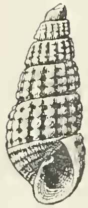
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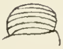
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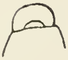
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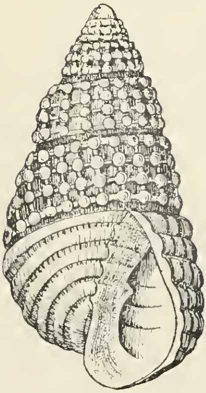
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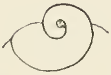
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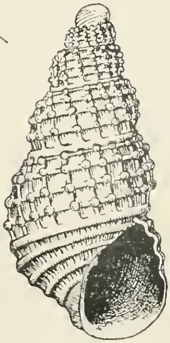
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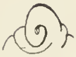
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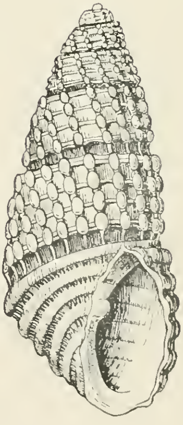
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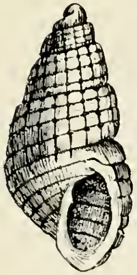
ODOSTOMIA

1. oldroydi, p. 150
2. cincta, p. 152
3. oonisca, p. 150
4. trachis, p. 148
5. clementina, p. 149
6. rinella, p. 146
7. ovata, p. 152
8. lucca, p. 148
9. nodosa, p. 151



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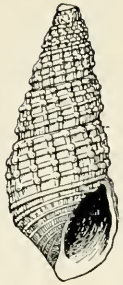

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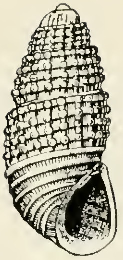

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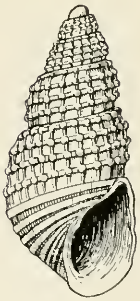

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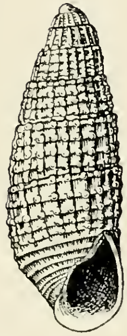

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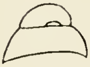

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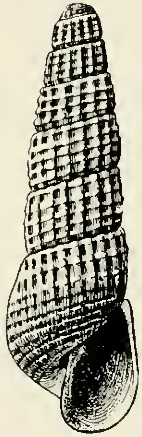

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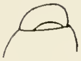

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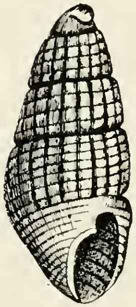

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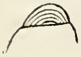

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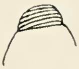

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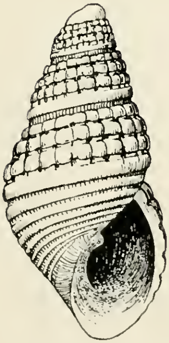

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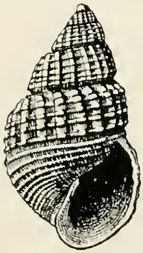

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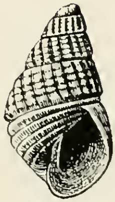

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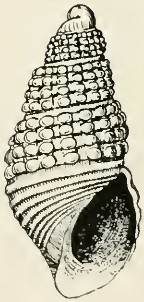
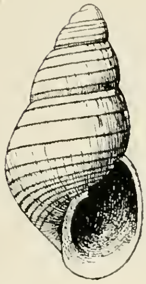


11

ODOSTOMIA

1. pulchra, p. 158
2. astricta, p. 154
3. loomisi, p. 153
4. cooperi, p. 155
5. tyleri, p. 157
6. scammonensis, p. 158
7. proxima, p. 157
8. hipolitensis, p. 155
9. lapazana, p. 156
10. pulcia, p. 160
11. vicola, p. 153



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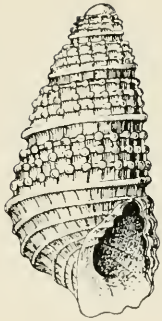

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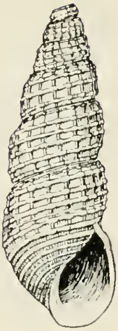

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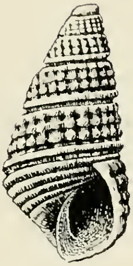

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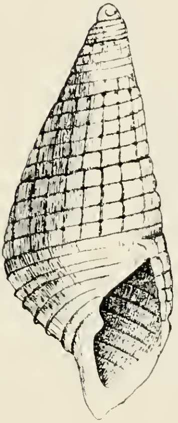

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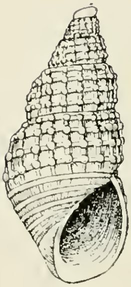

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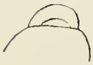

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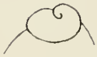

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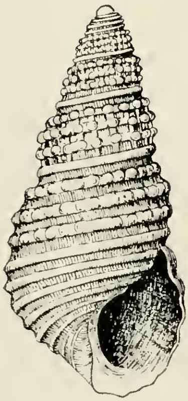

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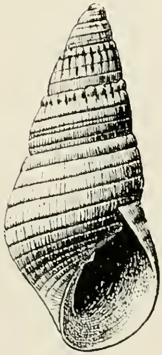

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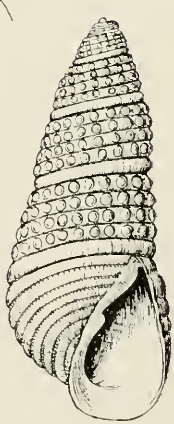
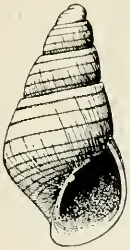


9

ODOSTOMIA

1. deceptrix, p. 169
2. fasciata, p. 165
3. oregonensis, p. 162
4. vincta, p. 165
5. defolinia, p. 161
6. montereyensis, p. 159
7. pulcherrima, p. 164
8. helga, p. 166
9. benthina, p. 163



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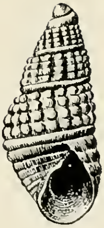

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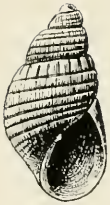

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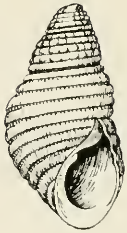

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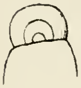

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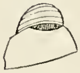

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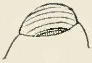

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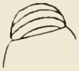

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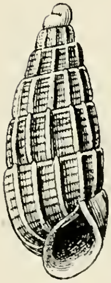

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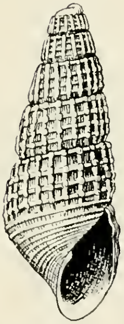

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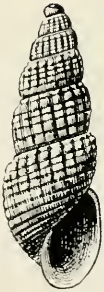

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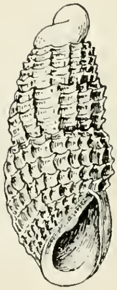

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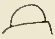

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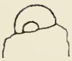

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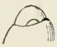

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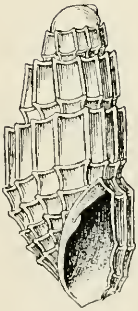

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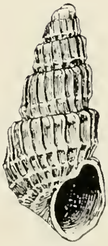

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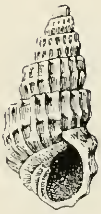

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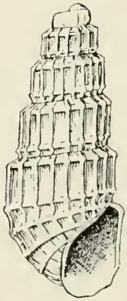
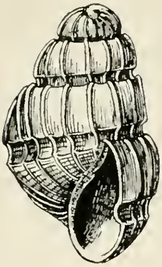


12

ODOSTOMIA

1. sanctorum, p. 167
2. promeces, p. 164
3. sapia, p. 167
4. rotundata, p. 168
5. marginata, p. 169
6. talama, p. 143
7. virginalis, p. 160
8. photis, p. 171
9. quinquecincta, p. 174
10. n. delmontensis, p. 174
11. navisa, p. 173
12. orariana, p. 175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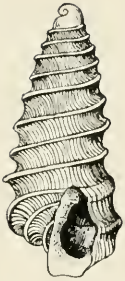
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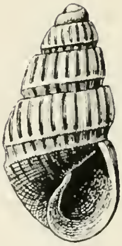
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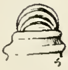
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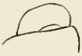
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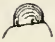
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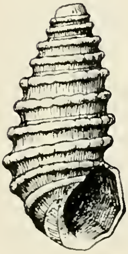
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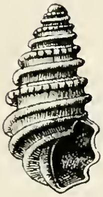
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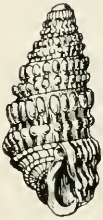
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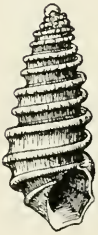
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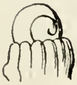
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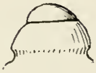
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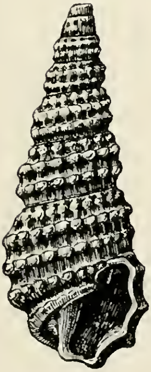
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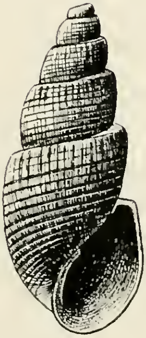
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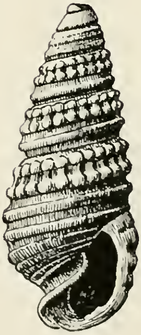
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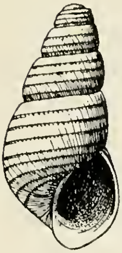
ODOSTOMIA

1. lacunata, p. 170
2. exarata, p. 177
3. poppei, p. 170
4. terebellum, p. 177
5. æpynota, p. 178
6. armata, p 177
7. galapagensis, p. 179
8. pedroana p. 172
9. turricula, p. 179
10. hemphilli, p. 176



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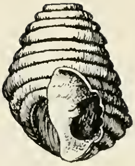

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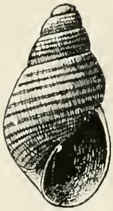

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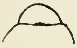

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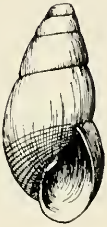

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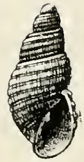

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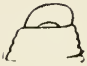

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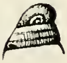

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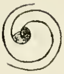

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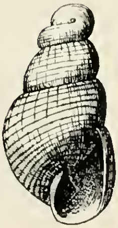

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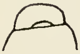

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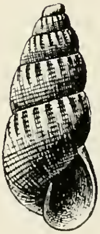

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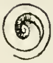

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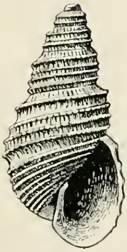

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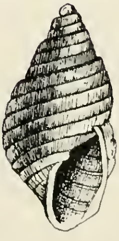

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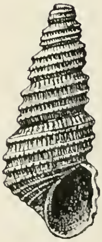
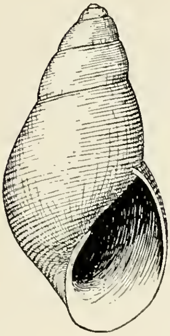


10

Odostomia

1. farma, p. 188
2. ziziphina, p. 186
3. æquisculpta, p. 191
4. sublirulata, p. 192
5. delicatula, p. 183
6. intermedia, p. 181
7. americana, p. 180
8. amianta, p. 182
9. callipyrga, p. 188
10. eucosmia, p. 183



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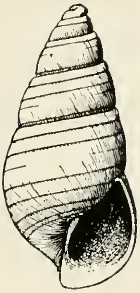

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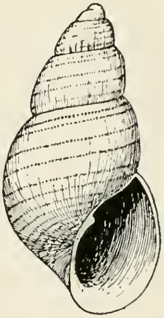

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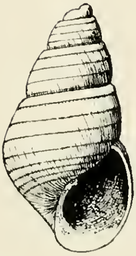

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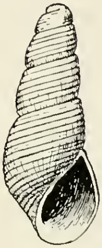

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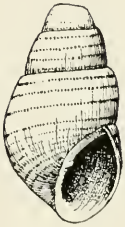

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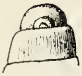

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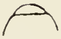

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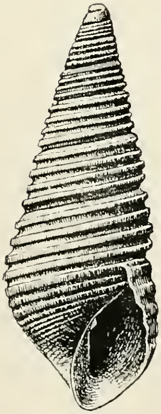

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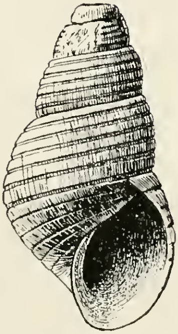

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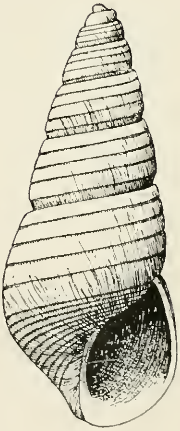
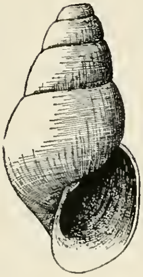


9

ODOSTOMIA

1. exara, p. 186
2. enora, p. 189
3. harfordensis, p. 191
4. amilda, p. 187.
5. pharcida, p. 185
6. chilensis, p. 189
7. grammatospira, p. 185
8. hypocurta, p. 190
9. fetella, p. 189



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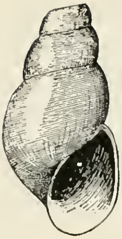

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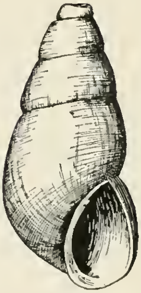

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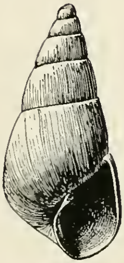

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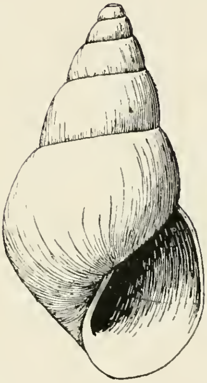

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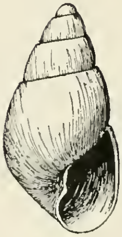

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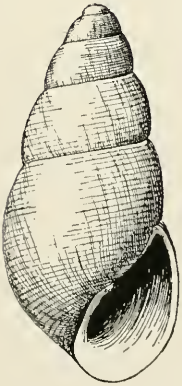

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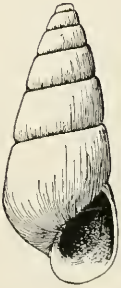

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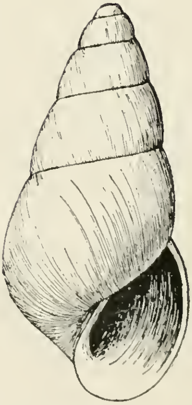
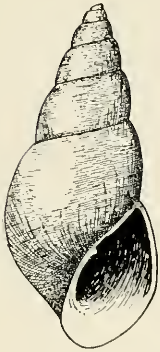


9

ODOSTOMIA

1. esilda, p. 196
2. tillamookensis, p. 195
3. tenuis, p. 197
4. io, p. 199
5. aleutica, p. 196
6. nunivakensis, p. 194
7. killisnooensis, p. 195
8. nemo, p. 198
9. kadiakensis, p. 197



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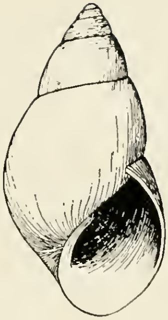

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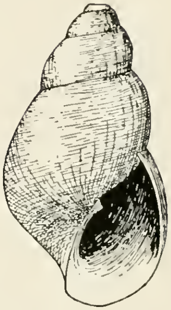

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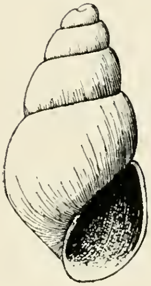

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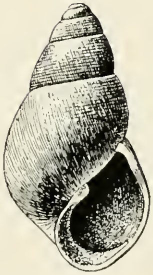

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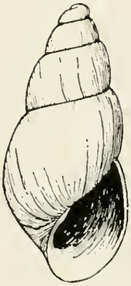

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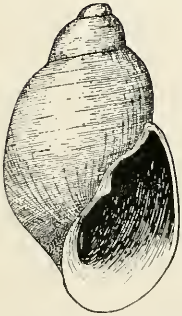

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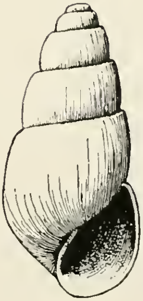

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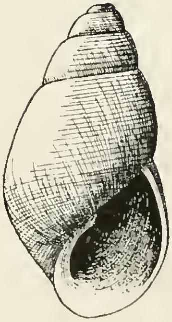
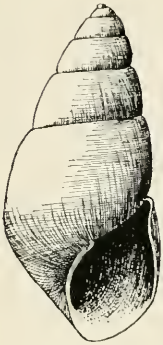


9

ODOSTOMIA

1. columbiana, p. 202
2. tenuisculpta, p. 206
3. jewetti, p. 201
4. pratoma, p. 199
5. phanea, p. 204
6. valdezi, p. 198
7. inflata, p. 201
8. herilda, p. 197
9. phanella, p. 205



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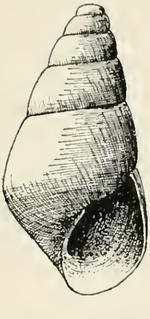

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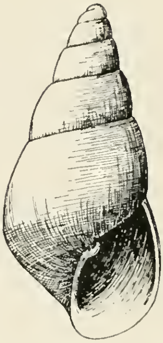

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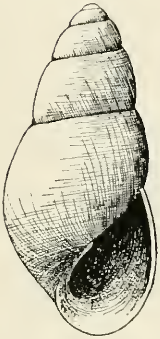

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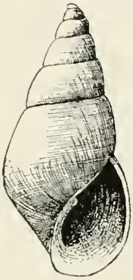

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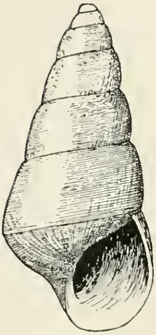

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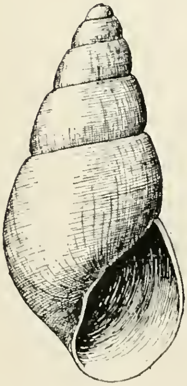

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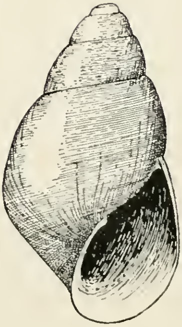

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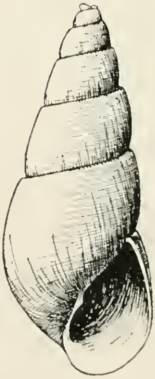
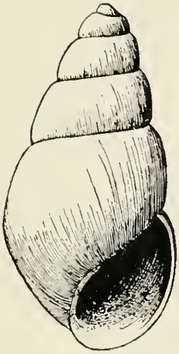


9

ODOSTOMIA

1. socorroensis, p. 208
2. californica, p. 208
3. donilia, p. 208
4. clessini, p. 211
5. stephensi, p. 210
6. angularis, p. 207
7. amchitkana, p. 210
8. tacomaensis, p. 209
9. serilla, p. 209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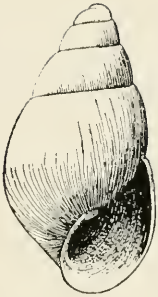
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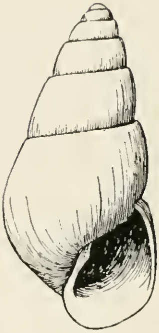
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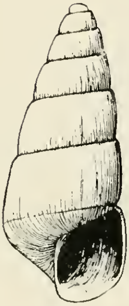
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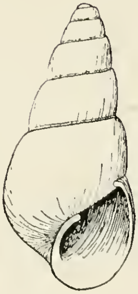
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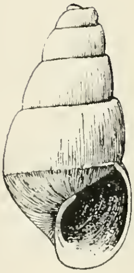
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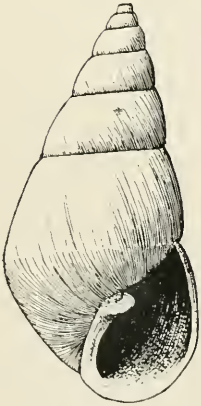
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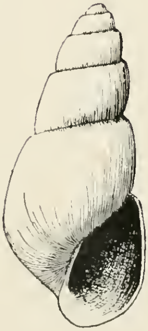
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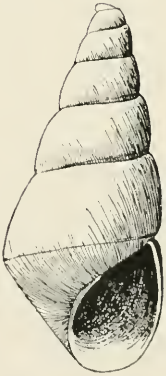
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2. altina, p. 214
3. baranoffensis, p. 215
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5. deliciosa, p. 216
6. notilla, p. 213
7. gravida, p. 212
8. profundicola, p. 214
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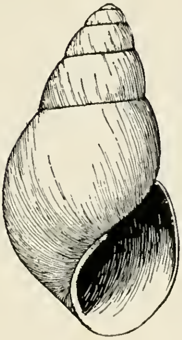
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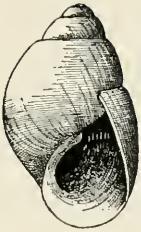
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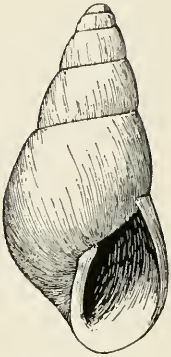
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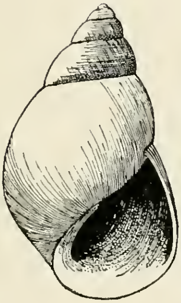
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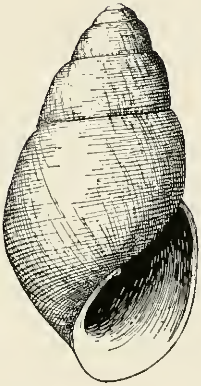
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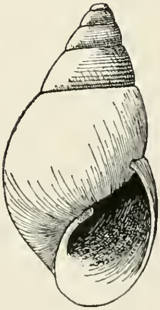
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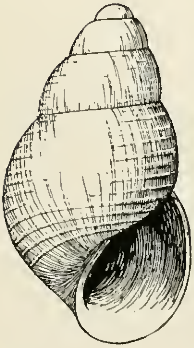
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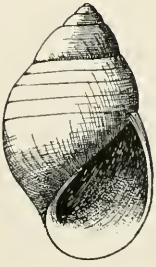
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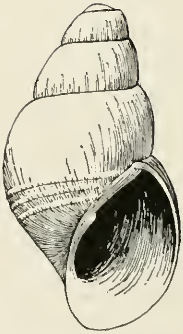
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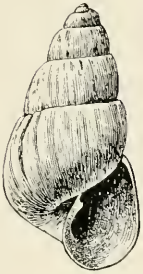

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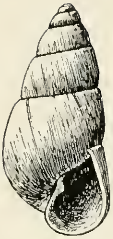

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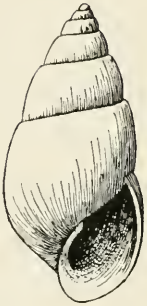

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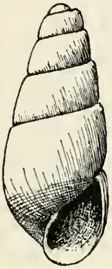

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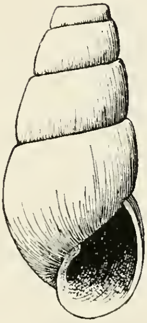

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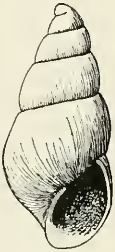

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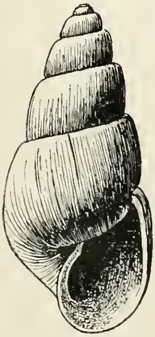

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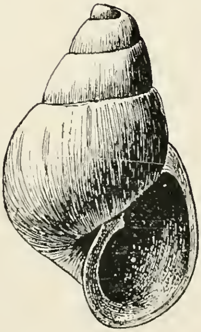

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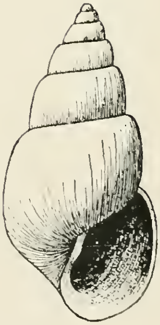

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ODOSTOMIA

1. satura, p. 221
2. gouldi, p. 224
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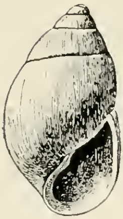
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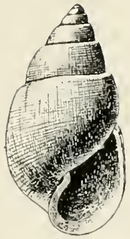
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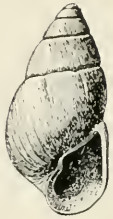
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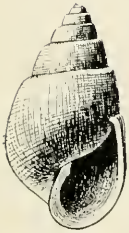
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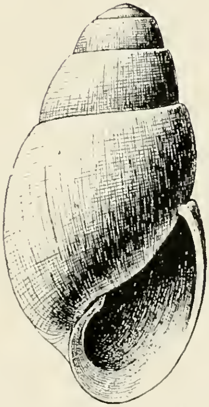
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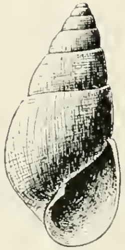
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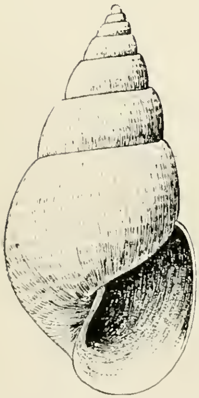
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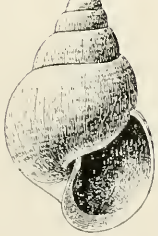
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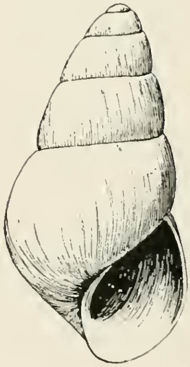
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5. arctica, p. 224
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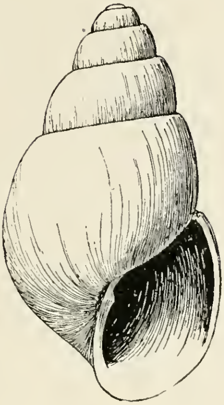

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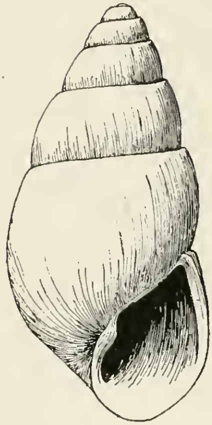

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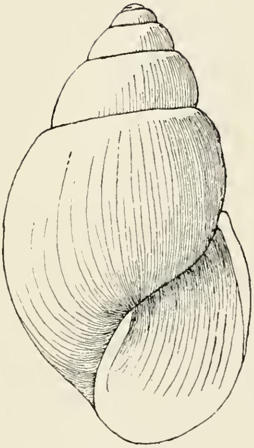

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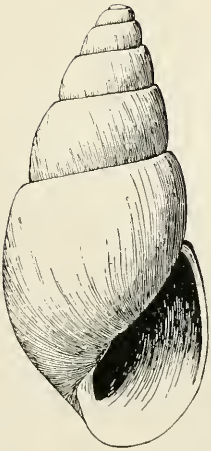

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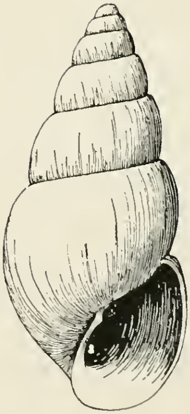

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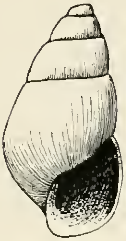
ODOSTOMIA

1. elsa, p. 220 2. pesa, p. 226 3. martensi, p. 229 4. iliuliukensis, p. 227 5. krausei, p. 223



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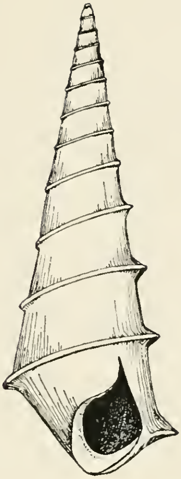

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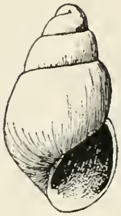

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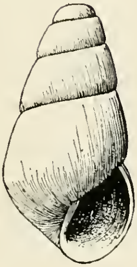

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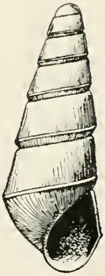

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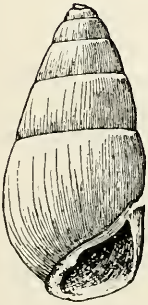

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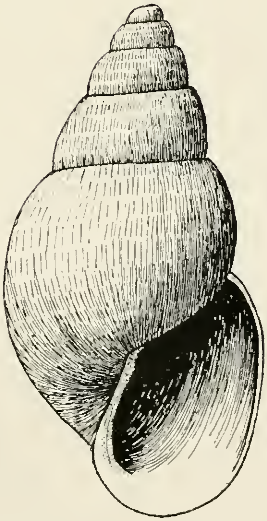

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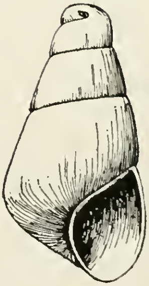

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Odostomia

1. dinella, p. 232
2. rangii, p. 230
3. coronadoensis, p. 233
4. farella, p. 232
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